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CONTENTS

Shaffer's Foot 191
OTTO F. SCHUSTER, New York.

Paget's Disease of the Bones (Osteitis Deformans) 194
HYMAN I. GOLDSTEIN, M.D., and
LEOPOLD GOLDSTEIN, M.D., of Cam-
den, N. J., and HENRY Z. GOLD-
STEIN, Philadelphia, Pa.

The Hallucinations of Myxedema... 201
HARVEY G. BECK, M.D., Baltimore,
Md.

Coffee in Health and Disease..... 202
EDWARD E. CORNWALL, M.D.,
Brooklyn.

Is Tuberculosis Conquered?..... 204
JACQUES W. REDWAY, Mt. Vernon,
N. Y.

OBSTETRICS AND
GYNECOLOGY 205

SURGERY 208

EDITORIAL

A Great Program..... 211
"Medical Heredity" 211
Seen in a New Light..... 211
In Grand Style..... 211
No Place for the Neurotic..... 211

MISCELLANY

Life Extension 212

MEDICAL HAPPENINGS 212

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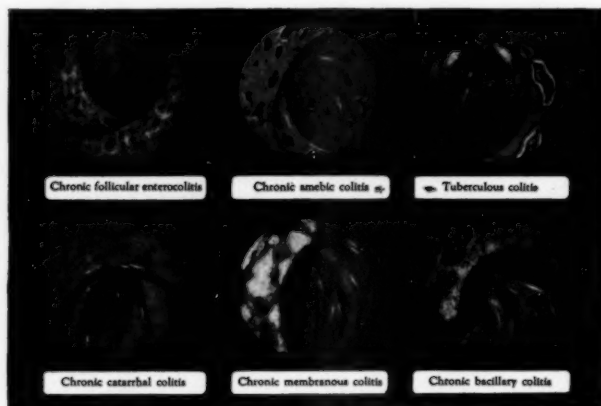
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Shaffer's Foot*

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New York.

Synonyms—Non-deforming clubfoot; Hollow or contracted foot; Claw foot; Talipes plantaris.

Definition—N. M. Shaffer, of New York, in 1885 gave the term "non-deforming clubfoot" to a foot defect that consists of a hollow or contracted foot with marked limitation of flexion and with a more or less clawlike position of its toes. This defect has become widely known as "Shaffer's Foot" and when the deformity of the toes is very marked, it is popularly termed "clawfoot" (See Fig. 1).

Causes—The condition appears most often bilateral, less often unilateral. Transient paralysis of the anterior muscle group of the lower leg, as the result of poliomyelitis, especially the abortive type, is considered a prominent cause. Also in the young, infectious diseases, particularly diphtheria and scarlatina, have been thought to be possible factors (Shaffer). In the adult, neuritis, gout and rheumatism (Whitman) and paralysis of the interosseous muscles and of the lumbricales have been considered a cause (Duchenne, Taylor), while especially in those cases occurring unilateral, trauma to the anterior muscle group or its nerve supply must be considered as an exciting influence. Again, in many instances of Shaffer's foot, one is neither able to get a history of disease such as those mentioned nor a history of trauma that would account for the existence of the defect. But since one often gets a history of other ailments that demanded a prolonged rest in bed but which per se cannot well be associated with the later development of Shaffer's foot, it would not seem unreasonable to surmise that here at least the prolonged rest in bed rather than the ailment necessitating it, is responsible for the foot disability.

In the recumbent position, the foot drops to an angle with the leg which is between (or nearly so) the extremes of flexion and extension (Ellis), an ideal position if continued long enough, for the development of Shaffer's foot.



FIGURE 1.

Fig. 1.—Drawing of a Shaffer's foot. Because of the clawlike position of the toes in many of these cases, the defect is popularly termed "clawfoot."

Pathology—When through an illness or an injury, the anterior group of muscles controlling the foot is either paralyzed or greatly weakened, the forefoot to which these muscles are attached drops, i.e., it bends downward at the midtarsal joint. The same drop, only to a milder degree, happens when through an enforced prolonged rest in bed, the anterior muscle group becomes overstretched by the position of extension in which the foot is held while the patient is in the reclining position. Through the plantar flexed forefoot the ball of

* (From advance pages of "Foot Orthopaedics," by Otto F. Schuster; edited by Maurice J. Lewi, M.D.)

the foot and the heel are brought nearer each other; the foot thus becomes shorter and much more highly arched (Compare Figs. 2 and 3). This change in the contour of the foot through the altered relationship between rear and forefoot is made permanent later by accommodative changes in the plantar fascia and in the structures beneath it. Additionally, through the plantar flexion of the forefoot, the relation of the weight-bearing area of the foot to the leg is materially altered. While in reality we have only a plantar flexed forefoot, its effect on the leg is the same as if the entire foot were plantar flexed or extended. This becomes evident when, upon recovery, the patient tries to lift or dorsiflex the foot. Depending upon the degree to which the forefoot has dropped and now is flexedly held in the new position by accommodative tissue changes, the foot cannot be dorsiflexed to anywhere near the normal angle with the leg. The fixed plantar flexion of the forefoot has in effect, produced a limitation of flexion of the foot.

To be sure, the range of dorsiflexion possible at the ankle joint is the same as before the foot altered its shape because the relation between the rear foot and the leg was not disturbed to any appreciable extent in the class of cases under consideration. This range of motion is now insufficient, however, to bring about an angle of 75 or 70 degrees between the weight-bearing area of the foot and the leg as needed in walking. The calf muscles, still functioning normally, relax to their proper extent when dorsiflexion is attempted but in these instances this does not permit the foot to be lifted to less than a right angle, or thereabouts, with the leg. Thus, while no shortening of the calf muscles exists in most cases of Shaffer's foot, these muscles, though normal, are too short to permit normal dorsiflexion of the altered foot.

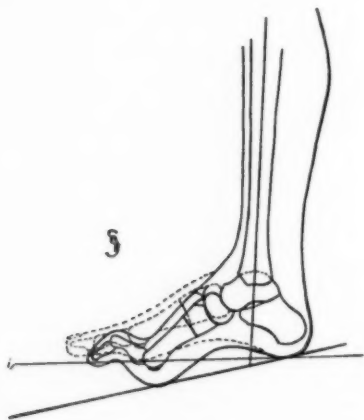


FIGURE 3.

Fig. 3.—The same foot as shown in Fig. 2, altered into a Shaffer's foot. The forefoot is plantar flexed at the midtarsal joint and is held in its new position by accommodative changes in the plantar structures. The foot has become notably shorter and much more highly arched. Additionally, through the plantar flexed forefoot, the relation of the weightbearing area of the foot to the leg is materially altered. This results in impaired locomotion since the flexors of the foot cannot lift the foot high enough to clear the ground in walking and since the leg cannot be bent on the foot to the necessary "walking" angle. The calf muscles are the agency which limits these actions.

In the healthy, average foot the range of upward motion or dorsiflexion is fifteen to twenty degrees from the right angular position between foot and leg. Let us assume that in the formation of the cavus the forefoot dropped fifteen degrees as represented in Fig. 4, and is fixed in this position by accommodative shortening of the plantar structures.

To lift the altered foot high enough so that the line of its weight-bearing surface forms an angle of 75 degrees

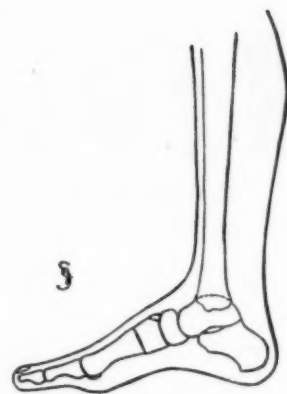


FIGURE 2.

Fig. 2.—Drawing of a medium highly arched foot.

with the leg as the foot did before it became deformed, would require almost double the amount of upward motion possible at the ankle joint.

To make this possible, the calf muscles opposing this motion would have to relax to an extent far greater than normal and since no such accommodation takes place, the foot, in this instance, can at best only be lifted 15 or 20 degrees upward from a level, 15 degrees below the right angular position between foot and leg which would bring it to an angle of 90 degrees, or near it, with the leg.

This angle, obtainable in the greater number of Shaffer's feet proves that the limitation of flexion of the foot is not produced by a shortening of the calf muscles in these cases as is so often supposed. If, in fact, there existed such shortening, it is evident that the foot could not be lifted to this angle with the leg.

Symptoms—The most disturbing feature in Shaffer's foot is the limitation of flexion of the leg on the foot and of the foot on the leg in walking. The patient's walk is ungraceful and jerky since he cannot bend his leg at the ankle joint to its normal extent. In walking, he is compelled to lift his heel off the ground long before the advancing other foot is in position. The ball of the foot thus receives the body weight far earlier than in the case of a normal foot and the excessive amount of work

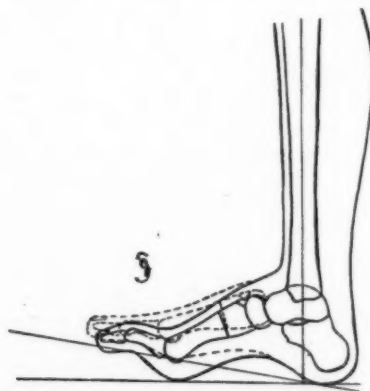


FIGURE 4.

Fig. 4.—When the forefoot has dropped fifteen degrees and is held in this position by accommodative changes in the plantar structures, the unimpaired calf muscles, able to relax only their normal degree, permit the foot to be dorsiflexed from fifteen to twenty degrees from a level, fifteen degrees below the right angular position between foot and leg. This brings the new weightbearing area of the foot to an angle of ninety degrees, or a little less, with the leg, while in the foot before it became altered, the same amount of relaxation of the calf muscles would have permitted the sole of the foot to be lifted to an angle of 75 or 70 degrees with the leg.

that this part of the foot is called upon to perform, results in the formation of protective pads of fibrous and fatty tissue beneath the metatarsal heads and especially under that of the first. This formation is hastened by the abnormal weight distribution in this exceedingly highly arched or contracted foot, in which the body weight, even in standing, is borne on the heel and on the ball of the foot only. The limitation of flexion of the leg on the foot in walking causes a severe and continuous strain in a dorsoplantar direction through the midtarsal joint and frequently produces a plantar neuralgia or plantalgia. Painful nodules in the plantar fascia as the result of the strain are apt to develop. These can be easily located in the examination by flexing the foot to its limit on the leg and then following the course of the plantar fascia from the heel to the toes by letting the finger glide forward along this tissue under light pressure.

Because the foot cannot be lifted or dorsiflexed beyond a right angle with the leg in walking, the patient stumbles and falls easily, especially when a shoe with a very low heel is worn. The effort to continually dorsiflex or lift the foot upward against resistance to this motion, as offered by the calf muscles, makes walking a very fatiguing act because the anterior muscle group is compelled to do more than its normal share of work. The strain to which the toe extensors are subjected in an effort to help lift the foot in walking is well evidenced by the position of the toes which are found to be hyperextended at the metatarsophalangeal joints and flexed at the joints anterior to these (See Fig. 1, also "Hallux Flexus").

Through the fixed hyperextension of the lesser toes at the metatarsophalangeal joints, the anterior metatarsal arch becomes permanently depressed and cannot function. In many instances, instead of a mild concavity transversely, the ball of the foot shows a decided convexity and as the result of the functional impairment of the anterior metatarsal arch, the patient frequently develops a "metatarsalgia" and painful callosities form beneath the three middle metatarsal heads. On the dorsum of the bent toes, painful excrescences develop through friction of the shoe against their most prominently dorsiflexed parts.

Treatment—To correct a Shaffer's foot without the aid of surgery is possible only in mild cases. The contracted plantar tissues are too strong to yield readily to manipulation and the mechanical appliances devised for the purpose of dorsiflexing the fore foot and for lowering the excessively high arch, while effective in a good many cases, are usually too painful and are so slow in giving results that the patient soon becomes discouraged and discontinues treatment. Thus, while an attempt to bring about a more normal shape of the foot by mechanical means is frequently a hopeless endeavor one can, nevertheless, help the patient considerably without an operation by improving the foot-function and by making weightbearing comfortable through the use of suitable appliances.

As has been pointed out, the most disturbing element in Shaffer's foot is the limitation of flexion of the foot, brought about by the plantar flexed forefoot. The parts that prevent the foot from being dorsiflexed beyond a right angle with the leg, are the calf muscles. These latter can be stretched by appropriate means (see chapter on "Limitation of Flexion of the Foot Through Shortened Calf Muscles").

While the stretching of muscles of normal length may appear to be an unusual and unwarranted procedure, it has been proven to be a very satisfactory method in improving function and in giving comfort in Shaffer's foot.

No harm is done to the calf muscles if the stretching is judiciously carried out and it surely is much easier to stretch these muscles than to stretch the contracted plantar tissue in the foot.

By increasing flexion of the foot, we will get a more normally acting foot in which the strain on the plantar fascia and other tissues is lessened and we will obviate the need for excessive work on the part of the anterior muscle group. This in turn, may enable us to improve the position of the toes, (See "Hallux Flexus") and to lessen the discomfort incident to the depressed anterior metatarsal arch. Where weight-bearing on the heads of the metatarsal bones is very painful, the use of a properly constructed plate, to transfer the weight to a point back of the metatarsal heads (see "Painful Affections of the Anterior Part of the Foot"), is indicated. In some, a Thomas bar or Thomas wedge (see "Hallux Rigidus") suffices to give relief and in very painful cases, one may have to use both the plate and the Thomas wedge to make the patient comfortable.

A shoe so constructed that the outer border of the contracted or hollow foot is made to bear weight, together with the heel and ball of the foot, is essential for comfort in all cases. Where, for some reason, in a Shaffer's foot the range of dorsiflexion cannot be increased by stretching the calf muscles, one can enable the patient to walk with greater ease and less fatigue by accommodating the limitation of this motion through a higher heel or by a cork lift under the heel inside the shoe, taking care by appropriate measures, to lessen the increased weight-bearing on the metatarsal heads.

862 Lexington Ave.

Focal Infection

Mr. G. W. F., age 42, civil engineer. Family history negative. Has suffered with eruptions over the body, back of arms, legs and face, for the past two years. Spent considerable time in hospitals and clinics under care of various physicians but to no avail. He had lost his position in an office owing to the unsightly appearance. He came to Morton Hospital on May 13, 1925. Tests showed tubercular reaction and Wassermann negative, the urine contained a slight amount of albumen. Tonsils were buried and infected with staphylococcus aureus. They were removed and an autogenous vaccine made from the pus which was injected every two days.

The numerous abscesses over the body were opened and the raw surfaces over his back and legs were covered with melted paraffine to relieve the intense pain. The discharging ulcers were cleansed every third day and a local application of paraffine applied. On May 30th, three weeks after the first examination, the man was discharged cured. The cause of this infection was, no doubt, due to a focus in the tonsils. After removing the cause, recovery was hastened by the use of vaccine. Relief that he received by covering the raw spaces with melted paraffine is only to be compared with the relief noticed in cases of burns.

The subject of focal infection from teeth and tonsils has made a wonderful impression on the profession as well as the public, and there are possibly more healthy tonsils and good teeth being extracted than diseased ones, which could be prevented by making a thorough examination beforehand. When a diseased tonsil, an infected tooth or gall bladder is removed, destroying the focal infection, we always see the result—(*Morton Hosp. Bulletin.*)

Voltaire and Public Health

Many great writers have been dyspeptic or troubled with ill health all their lives and yet reached a green old age. Some famed writers have been virulently dyspeptic, surcharged with bile and yet almost seem to have enjoyed their bad health. Among this illustrious company were Charles Darwin, Thomas Carlyle, the dyspeptic in *excelsis* who frequently poured out bile in his writings, Samuel Johnson, Herbert Spencer, and last but not least Voltaire. Like many another man who lived to be old he was a punny infant and was in the habit of complaining throughout his long stay on earth that he was on the brink of the grave. He died at the respectable age of eighty-four from kidney disease accelerated by an overdose of opium. It is said now that the stories of the anguish and remorse of his later days do not seem to rest on any sound foundation.

Paget's Disease of the Bones (Osteitis Deformans)

With Report of Seven Additional Cases

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In two previous papers on the subject of Osteitis Deformans, I, H. I. G., reported a total of thirteen cases. (*MEDICAL TIMES*, November and December, 1922, and March, 1924.)

Case XIII, (Edward S.), in my (March, 1924) last report—died January 28, 1926, while in the Philadelphia General Hospital; service of Dr. S. S. Cohen. He was a white adult male, aged 62 years. An autopsy was performed. This was a typical *advanced case* of osteitis deformans.

I wish now to report seven additional cases of Paget's disease—making a total of twenty cases. All of these cases, with the one exception (Charles R., Case XIX), were patients in the Philadelphia General Hospital.

I appreciate very much the opportunity to study and report these cases and I wish to acknowledge, with thanks, the assistance and cooperation and permission of the visiting chiefs, in whose services these cases occurred. I want to express my appreciation especially to Doctors L. Napoleon Boston, A. A. Stevens, Joseph Sailer, Ross V. Patterson, Wm. E. Robertson, M. A. Burns and David Riesman.

B. Franklin Stahl reported two cases (with autopsy in one) of osteitis deformans before the section on General Medicine of the College of Physicians of Philadelphia, December 19, 1911, (*Amer. Jour. Med. Scs.*, April, 1912). He also mentions a list of thirty-four cases reported since 1906, to the date of his report. The case he reports (E. H., aged 65 years, white female), was a patient in his service in the wards of the Philadelphia General Hospital. She was admitted to the hospital, August 15, 1910, died October 25, 1910. This case came to autopsy, performed 31½ hours after death. A sister of this patient had the same disease in an early stage. The report of this case also appears in Philadelphia General Hospital Reports—(Vol. VIII, 1910, p. 177). Dr. Stahl includes a complete report of the autopsy which was performed by Dr. A. G. Ellis, Assistant Pathologist to the Philadelphia General Hospital at that time.

Packard, Steel and Kirkbride (*Amer. Jour. Med. Scs.*, p. 552, CXXII, 1901) report a very complete study of a case of Paget's disease that also occurred in the Philadelphia General Hospital. A white man, aged 62 years. Was very deaf, large head. The autopsy showed the calvarium measured 1¼ to 2 cm. in thickness. Sections of hypophysis cerebri and suprarenals were normal. He had a typical giant celled sarcoma of frontal bone. They found *only 66 true cases* in the literature, of Paget's Disease as described by Paget in 1877. Now (1926), I believe there are 400 cases recorded in the literature of the world.

Charles Lyman Greene, of St. Paul, Minn., in his book on Medical Diagnosis, classifies osteitis deformans, leon-

tiasis ossea, pulmonary hypertrophic osteoarthopathy (Bamberger's Disease), etc., under the heading "Certain Diseases of Unknown Causation." He defines "Paget's Disease" as a rare disease, characterized by kyphosis of the upper spine, a broad-based thorax, lozenge-shaped abdomen, marked enlargement of the cranial portion of the head and enlargement and deformity of the long bones, due to a rarefying osteitis. "The disease is extremely rare and of unknown etiology."

R. Lawford Knaggs, of London, delivered a Hunterian Lecture before the Royal College of Surgeons of England on February 11, 1925 on "Osteitis Deformans and its Relation to Osteitis Fibrosa and Osteomalacia." (*Brit. Jour. Surg.*, p. 206, Oct., 1925). Sir James Paget, who first described this disease fifty years ago, before the Royal Medico-Chirurgical Society gave us a complete picture of the condition, which has not been improved upon very much since that time.

Knaggs says Paget's disease is "A very chronic disease of an inflammatory nature, occurring in middle-aged or elderly people, in which the normal osseous structure of the skeleton is removed, and fresh bone, formed on a different plan and in a larger mould, takes its place." It is the bone changes that constitute the important and characteristic feature of osteitis deformans. Pain is one symptom directly connected with them. It is exceptional for the skull not to be greatly enlarged. Enlargement and softening characterize the bones which are attacked by osteitis deformans. Knaggs divides the disease in two types: 1. Generalized—many bones. 2. Limited—single bone.

Scpiades (1924); Vedel and Puech (1924); Gopner (1924); Alker (Jan. 23, 1925); Miles and Feng (Jan., 1925); Graetz, Hutchison, Wampler, Gilis and Vallois, Blum; Maxwell and Miles (June, 1925); Stapleton (May 30, 1925); Urechia and Bodea (May 30, 1925), and others have written on *Osteomalacia* recently.

Kehl (Jan. 23, 1925), Meyer and Sichel, Ripa and Musil, Heacock, Cunha, Buttner, Friedrich, have recently reported on osteochondritis deformans juvenilis or Legg-Perthes disease.

Osteitis fibrosa has been reported on during 1925, by Leri and Linossier, L'eri and Ruppe, Sicard and Chauveau; Campanacci, D. (1924); Baastad, W. F. (1924), Caan, P. (1924); Potts and Hatton (1924).

Vallery-Radot and Aris (1924), and Wagoner (G. W.) 1924, wrote on osteopsathyrosis.

Case Reports

Case No. 14

Harry McIlvaine (L. 5508). Service of Dr. L. N. Boston—Chief; Asst. Chiefs—Drs. A. E. Blackburn and H. I. Goldstein. Medical ward—333. White man, aged 75 or 80 years. Patient brought to Philadelphia General Hospital from Holmesburg. Patient is stone deaf and no history obtainable.

General Examination: White, senile, adult male—age about 75 or 80 years. Extreme emaciation and dehydration.

Head and Scalp: Very large head.

Eyes, Ears and Nose: Pupils round. Cataracts well advanced (Dr. Pontius).

Ears: Unable to definitely determine type of deafness because of inability of patient to co-operate for functional hearing tests (Dr. Zacks).

Neck: No abnormal pulsations.

Thorax: Small, thin thoracic cage. Hyperresonant throughout. Breath sounds transmitted well. Voice sounds good.

Heart: Slight enlargement to percussion. Chronic myocardial degeneration present with mitral insufficiency.

Abdomen: Liver, large and hard and rather nodular. Scaphoid abdomen—no tenderness, hard and firm.

Extremities: Slight bowing of legs. Reflexes all present and good.

Diagnosis

1. Chronic myocardial degeneration.
 2. Cirrhosis of liver.
 3. Paget's disease of bones.
- 5/6/26. **Urine Analysis:** Yellow. Alkaline. S. G. 1.020. Faint trace albumin. No sugar. Triple phosphates.

5/6/26. **Blood Chemistry:**

Blood sugar 114. mgm. per 100 c.c.

Blood urea 10. mgm. per 100 c.c.

Uric acid 3.6 mgm. per 100 c.c.

5/14/26. X-ray (No. 32542) (E. B. Holmes, M.D.)—Paget's Disease involving the bones of the skull, femora, tibiae and fibulae. The bones of the feet are not involved. Marked atheroma.

Blood Wassermann: Negative.

5/25/26. Patient died this morning. Photographs were ordered taken, but patient was too weak to be disturbed during the past few days. The photographer appeared after the body was removed.

Case No. 15

Isaac B. W., Philadelphia, Pa. Admitted 4/30/26. Discharged 5/8/26. Men's Medical Ward 336. Philadelphia General Hospital. Service of Dr. A. A. Stevens—Internes: Drs. Rourke, Campbell, Harvey. White adult male, aged 61 years. Iron worker. Referred to Philadelphia General Hospital by Dr. C. A. Heiken.

Chief Complaint: Pain in right hip, back and shoulder blade. H. P. I.: Thirty years ago following a fall in which he hit the back of head—has noticed a slow but steady increase in size of head—noticed on buying of hat. At that time size 6½—at present 7¾. Trousers smaller in size now—from 32" to 27"—lost four inches in height. Troubled with headache for past fifteen years. Increasing deafness for past three or four months—headache every other day. Generalized weakness and aching. Pains in hip, shoulder and back.

P. M. H.: Appendectomy, 1906. Hemorrhoidectomy, 1900. Had measles and typhoid fever (at 10 years).

F. H.: Mother died of epilepsy. Father killed in Civil War. Two sisters dead. One sister living and well.

M. H.: Widower seven years. Had eleven children. Two dead—one stillbirth. Diphtheria and scarlet fever. Nine children living and well. Denies all venereal diseases. He has been a structural iron worker. Drinks tea and coffee moderately. No liquor since 1924.

Blood Pressure: 136/70.

4/30/26. Final note (Dr. Rourke): Patient is a little old man of 61 years. He is alert, his eyes bright, his legs are bowed, and his head is large—gradually growing larger during past eighteen years. Hair is sparse and thin. Pupils regular and react promptly.

Mouth: Tongue moist and clean.

Teeth: Only one tooth remaining.

Throat: Tonsils not enlarged nor cryptic.

Neck: O. K.

Examination—Chest: Emphysematous in shape. Subcostal angle is 90 degrees. Hyperresonance throughout. No rales.

Heart: Not enlarged. Sounds clear and regular and of fair quality. No murmurs.

Abdomen: Scaphoid. Liver, spleen and kidneys not palpable. No rigidity or tenderness.

Genitalia: Normal.

Extremities: Brachial arteries are tortuous and dancing. Radial arteries are like pipe-stems. Pulses are equal and of fairly good volume.

Lower Extremities: There is extreme bowing of the bones of both lower extremities. Patellar reflexes absent. No Babinski or ankle clonus. Right lower extremity shorter than left.

Diagnosis

1. Paget's disease of bones.
2. Advanced arteriosclerosis.

Laboratory Reports

5/25/26. **Blood Count:** R. B. C., 5,480,000. W. B. C., 6,250. Hb., 13.2 grams. Polys., 72 per cent; Lymphs., 24 per cent; L. and Trans., 4 per cent.

5/25/26. **Urine:** Amber, acid, 1.034; no sugar, no albumin.

5/1/26. X-ray (E. B. Holmes, M.D.) No. 32390: Osteitis deformans.

5/1/26. **Urine Analysis:** Yellow, neutral, S. G. 1.024, no albumin, no sugar, some mucus.

5/7/26. **Wassermann:** Negative (all antigens).

Blood Chemistry: Blood sugar... 91 mgm.

Urea 14 mgm.

Uric acid 4 mgm. per 100 c.c. blood.

5/25/26. This patient was readmitted to the Philadelphia General Hospital, Medical Ward No. 333, Service of Visiting Chief, Dr. L. Napoleon Boston and Assistant Chiefs, Doctors A. E. Blackburn and H. I. Goldstein. 5/29/26. Discharged.

5/26/26. X-ray, No. 32689. Osteitis deformans involving the lower two-thirds of femora, upper tibiae and fibulae. Arteriosclerosis.

5/26/26. **Eye Grounds:** O. D. dense opacity of all but upper and outer part of lens. Disc not seen. O. S. Media clear. Disc indistinctly seen—edges poorly defined. Veins slightly increased in size (Drs. Pontius and Donnelly).

5/26/26. **Nose:** Filled with purulent crusts particularly on right. Septum is deviated high on the right and low on the left.

Tonsils: Embedded and diseased.

Ears: Drums markedly retracted—no perforations.

Functional hearing test reveals very slight conductive deafness as shown by prolongations of bone conduction and impairment of hearing 64 D. V. tuning fork. High notes intact (Dr. Zacks).

Urine: Amber. Acid. 1.034, no albumin, no sugar, no casts, occasional leucocyte, mucus present.

Case No. 16

Emma Rawlins: Service of Drs. Jos. Sailer and A. A. Stevens, Women's Med. Ward 213, Philadelphia General Hospital—No. L 2700. Interne: Dr. W. Costner. Admitted 8/26/25—Died 10/15/25. This patient was also in the service of Dr. Wm. E. Robertson. Colored woman. Aged 63 years.

Chief Complaint: Pain in the right thigh.

H. P. I.: She was as well as usual until August 5th when she was getting in a wheel chair she hurt her back, hip and thigh when she slipped.

F. H.: Father died at 70, mother at 80 years. Two brothers living and well. Husband, aged 59, had three "strokes." One child died few weeks after birth.

P. H.: Had mumps, asthma, rheumatism. She had the "African fever," was all swollen up, especially the feet and legs. She says it was a "malarial sickness." The bones were straight until 20 years ago. She returned from Africa 25 years ago—about 20 years ago she began having "rheumatism." The bones began to curve. She fractured left thigh by a trivial accident. She is not sure which bones curved first. She says her people were Indian and had large heads. She lost several inches in height.

Physical Examination: An adult colored woman about 60 years of age. She is poorly developed. The head is large and distorted in outline. The tibiae and humerus (left) are curved. The mandible is pointed and protruded more than normally.

Head: Large, scalp negative. Skull—"bony bulging" over both ears.

Ears: Grossly negative.

Nose: Grossly negative.

Eyes: Pushed downward. Movement upward diminished. Upper lids cover upper part of iris. Pupils equal, regular and react to light and accommodation normally.

Mouth: Lower teeth carious. Upper artificial denture. Mucous membrane pale.

Neck: Negative.

Chest: Anteriorly symmetrical, expansion limited or practically fixed.

Lungs: Vocal fremitus diminished at right upper and absent at left upper. Resonant or hyper-resonant throughout.

Breath Sounds: Harsh and bronchovesicular.

Heart: Apex in 5th interspace in midclavicular line. Sounds regular, clearly heard. Aortic second sound slightly accentuated.

Abdomen: Protruded. No masses or tenderness; tympanitic. Liver and spleen not palpably enlarged.

Extremities: Curvature of bones of legs and arms; feet slightly edematous.

Impression: Osteitis deformans.

9/1/25. Mental symptoms prominent. Gradually failing.

9/25/25. Lower extremities becoming very edematous.

10/15/25. Eyelids became edematous, also right side of face.

Heart action weak for past few weeks.

10/15/25. Died at 2:4 p. m. Cardiac failure.

Final Diagnosis

- Osteitis deformans.
Chronic myocarditis.

Laboratory Reports

8/29/25. X-ray—No. 29596. Paget's Disease involving the bones of the skull, lower lumbar vertebrae, pelvis, and both femurs, also entire left tibia and fibula, and upper two-thirds of the right tibia.

8/28/25. Urine Analysis: Acid. S. G. 1.012, trace albumin, no sugar, few leucocytes and crystals.

9/11/25. Blood Wassermann: Negative (all antigens).

Blood Chemistry: Sugar 100 mgm.
Urea 19 mgm.
Uric acid 40 mgm.
Calcium 9.6
Phosph. 3.0

This case is reported with the kind permission of Drs. Joseph Sailer, A. A. Stevens and W. E. Robertson, Visiting Chiefs to the Philadelphia General Hospital. She was also a patient for a few days in the Cooper Hospital, Camden, N. J., and was seen by Dr. I. J. Stewart (August, 1925).

Case No. 17

John Wermuth: Service of Dr. Ross V. Patterson, Men's Med. Ward 333. L. 3289. Philadelphia General Hospital. Intern—Dr. W. A. Rourke.

Admitted October 28, 1925—Discharged 11/9/25.

White adult male. Aged 65 years. Iron moulder.

Chief Complaint: Soreness in knees. Bowing of legs. Shortening in height.

H. P. I.: Three and a half years ago—soreness and stiffness in right knee. Treated for rheumatism. Was not troubled much to February, 1925—when both knees became involved and forced to stop work and go to bed. At this time noticed he was getting bow-legged, and that he was having a great deal of pain in his legs, and again treated for rheumatism. He was then later told he had Paget's disease of the bones, and that he would never be any better—Admitted to Philadelphia General Hospital, October 28, 1925.

Family H.: Mother and father died past 80 years. Three sisters dead and three brothers and sister living and well.

P. H.: Married—wife living, but in poor health. Four children living and well. One child died of accident. Uses alcohol and tobacco moderately. Is iron moulder by occupation. Denies all venereal diseases.

P. M. H.: Ten years ago had some vertigo. Everything else negative.

General Appearance: A well nourished, fairly developed adult, white, male, aged 65 years, not acutely ill and apparently comfortable. Short in stature, markedly bow-legged—greater bowing of tibial and fibula than femur. Diameter between knees nine inches. Duck walk.

Head and Scalp: Grossly negative.

Eyes: No ptosis, nystagmus or strabismus.

Pupils: Irregular, react to light and accommodation.

Nose: Grossly negative. No discharge. Slight deviation of septum to right.

Ears: No tophi, no discharge. No pain, redness, tenderness or swelling in front of ears or over mastoids.

Mouth: Tongue large, thick coated. False teeth. Gums all right. Tonsils, enlarged, no cryptic retention.

Neck: Short, no tenderness or masses palpable. No adenopathy.

Chest: Emphysematous type of chest—barrel-shaped; base of thorax markedly enlarged. Expansion decreased, but equal. Vocal fremitus decreased. Percussion note hyper-resonant throughout. Breath sounds enfeebled, wheezy and harsh in character. No rales heard.

Heart: No precordial bulging—no visible apex beat. No thrill or shock palpable. No cardiac enlargement, by percussion. Sounds regular in rate and force—first sound at apex replaced by soft systolic murmur. No other murmurs heard. Aortic second sound accentuated.

Arteries: Sclerotic.

Abdomen: Wall thick and obese. No tenderness nor masses palpable. Liver and spleen not felt.

Extremities: Upper, negative. Hands large. Lower, much bowing outward and curving of tibiae, fibulae, and femora—diameter of nine inches between knees.

Genitalia: Negative.

Impression: Paget's disease.

Emphysema.

Generalized arteriosclerosis.

11/3/25. No change in patient's condition.

Complains of pains in legs.

X-ray confirms diagnosis of Paget's disease of the bones (Dr. W. A. Rourke).

I saw this patient several times before his discharge and the case is being reported with the kind permission of the Visiting Chief, Dr. Ross V. Patterson. This is a typical case of osteitis deformans.

11/5/25. Patient discharged.

Final Diagnosis

1. Paget's disease of bones.
2. Emphysema.
3. Generalized arteriosclerosis.

Laboratory Reports

10/30/25. X-ray—No. 30169. The appearance of the skull suggests early osteitis deformans. There is considerable bowing of tibiae, and fibulae and femora. There are many irregular areas of rarefaction in both condyles and through tuberosities of the tibiae. The patellae show similar areas. The feet or tarsus show no definite areas other than slight enlargement of metatarsal of great toe of left foot, with some bone sclerosis.

10/29/25. Urine Analysis: Straw color, acid, S. G. 1.018, no albumin, no sugar. Few hyaline casts, occasional leucocyte. Uric acid crystals, some mucus.

Blood Wassermann: Negative (all antigens).

Blood Chemistry: Blood sugar 96 mgm.
Urea 15 mgm.
Uric acid 5.4 mgm.

Case No. 18

David E.: This patient, an adult white male, aged 65 years, was in the service of Dr. David Riesman, Men's Medical Ward 335, Philadelphia General Hospital, and later transferred to the neurologic service of Dr. M. A. Burns, Philadelphia General Hospital, and will be reported in detail by others.

I saw this patient, a typical case of Paget's disease, early in May, 1926.

Blood Wassermann: Negative (all antigens).

Colloidal gold—negative (000000000).

4/25/26. Blood Count: R. B. C., 3,740,000.
120 S

Blood Pressure: 60 D

Urine: Trace of albumin, no sugar, S. G. 1.010.

4/26/26. X-ray—No. 32244: Skull shows rarifying proliferative osteitis, characteristic of osteitis deformans. Proximal end of femur shows same.

Eye Grounds (Dr. Pontius): Arteries small and tortuous, veins full. Disc round, central excavation.

Case No. 19

Charles R.: Light colored man. Camden, N. J. Aged 48 years. Was first seen by me on May 10, 1925, suffering from "kidney trouble and uremia." He had been a patient during March and April, 1925, in the Philadelphia Polyclinic Hospital of the University of Pennsylvania. He had been suffering from "kidney trouble" for five years, and had, at one time, a systolic blood pressure of 220. When I saw him he was mumbling and delirious. Pupils were normal, reacted to light and no Kernig present.

S. 145

Blood Pressure: D. 70

Bowing of the forearms and left thigh. Skull appeared large. This patient was admitted to the Polyclinic Hospital on March 9, 1925. Ward "C." Service of Dr. A. E. Roussel, Record No. 43620. He appeared to be a case of hypertensive heart disease with rapid rate and a history suggesting urethral stricture. Examination at this time showed a large, violent, rapid heart with soft systolic murmur at the base.

Chief Complaints: Pain and weakness in lumbar region, premature ejaculations for many years. A postal clerk by occupation. Wife and child in good health. First child died during birth. No tuberculosis, diabetes or mental disease in the family.

Past History: He had two teeth extracted in 1922 at Jefferson Hospital. He had a "stroke" in 1915. Circumcision in 1905 at Pennsylvania Hospital. Had measles, influenza (1907) six weeks—four weeks in bed. He was sick, at home, in 1924 for two months—one month in bed. At the age of twelve years he was struck in the sacro-lumbar region by a train. About two and a half years ago he began to have severe headache and a reduction of strength and "heavy heart beat." At this time (March, 1925) he stated that about a month ago he had pain over the kidney region—radiating down the back of the thighs for two weeks. Appetite poor for the past month. Occasionally vomits with relief of the headache and nausea. Is very nervous, sleeps poorly and is quite worried.

Examination (3/10/25): An intelligent mulatto of 47 years. Appears worried and of nervous temperament. Skull is large and the anterior portion narrow—posterior portion much more bulky. Some pyorrhea. Tongue dry and somewhat coated. Cervical and axillary lymph nodes—negative. Heart is enlarged—rhythm regular. Aortic second sound accentuated. Systolic murmur at apex.

S. 174

Blood Pressure: D. 90



Left to right:—Top row.—Case ii, William S.; Case iii, Anna S.; Case ix, Henrietta N. (Pagets Disease of Bones). Center row:—Case xv, Isaac B. W.; Case xv, Isaac B. W.; Case xvi, Emma R. Lower row:—Case xviii, D. E.; Case xviii, D. E.; Case xx, G. H.

Lungs: Fibrosis at apices (anteriorly).
Abdomen: No tenderness nor masses.
Genitalia: Negative.
 3/10/25. **Cerebrospinal Fluid:** 8 cells. Protein increased.
Wassermann: Negative.
Colloidal Gold: 0112211000.
 Sugar present.

Blood Chemistry: 3/10/25. Sugar 102 mgm.
 Creatinine ... 3.2 mgm.
 Uric acid ... 5.1 mgm.
 Urea—N ... 53 mgm.
Urinary Chlorides: 3/26/25 4/3/25 4/9/25
 3.186 gm. 4.32 gm. 3.28 gm.
Urine Analysis: 3/10/25 3/16/25 4/20/25
 Straw, alk., 1.012. Pale lemon, alk., Lemon, 1.008.
 Albumin. 1.013. 2 Albumin.
 No sugar. Trace of albumin. No sugar.
 No cases. No casts. No casts.
 No pus cells. No pus cells. No R. B. C.
 No casts. Phosphates.

Phenolsulphonphthalein Output:
 3/25/25. Intramuscular ... 5% first hour—2% second hour.
 4/10/25. Intravenously ... 5% first hour—5% second hour.
Mosenthal Test: 3/12/25. **Mosenthal Test:** 3/29/25.

S. G.		S. G.
8 o'clock—60 cc. 1.013	8 o'clock—220 cc. 1.012	
10 o'clock—77 cc. 1.012	10 o'clock—90 cc. 1.012	
12 o'clock—57 cc. 1.014	12 o'clock—150 cc. 1.014	
2 o'clock—66 cc. 1.009	2 o'clock—40 cc. 1.012	
4 o'clock—100 cc. 1.010	4 o'clock—130 cc. 1.012	
6 o'clock—54 cc. 1.006	6 o'clock—85 cc. 1.012	
8 o'clock—45 cc. 1.010	8 o'clock—120 cc. 1.012	

Electrocardiogram: 3/10/25. Resistance (1000)
 (513) (1000)
 (1000)

Regular rhythm. Rate 96. No ventricular preponderance.
 Flat T and P in lead I.
 Normal P-R interval.
 T upright in all leads. (Dr. J. E. Talley.)
 3/24/25. (41) Resistance (2000)
 (2000)
 (2000)

Regular rhythm.
 Left ventricular preponderance.
 Normal P-R interval. (Dr. J. E. Talley.)
 3/11/25. **Eye grounds:** Normal.
 Optic discs oval 90, good color, central physiologic cups, outlines distinct, no swelling. Arteries rather small and veins slightly overfull. No hemorrhages or exudates in retinae or choroids. (L. F. Appleman.)

3/11/25. **X-ray** (Dr. G. E. Pfahler): Shows general cystic osteo-fibrosa (?) or *Paget's disease of the bone*. The cranial bones are from two to three times as thick as normal. Show irregular deposits of dense bone and cystic process. This condition is shown also in left femur, left forearm and right tibia. Presumably the other bones are more or less involved.

Rectal Examination: Negative.
 4/22/25. **Blood Wassermann:** Negative—all antigens.
 4/13/25. **Prostatic Slide:** Negative.
 S. 152
 4/8/25. —. Some improvement.
 D. 90
 4/13/25. Complains of premature ejaculations for many years.

4/17/25. **Urethro.-Cystoscopy:** Residual urine 6 ounces. Slight trabecular hypertrophy, especially over each urethral orifice suggestive of tabetic bladder. Trigonum—congested. Urethral orifices—normal.

Functional Test: I. C.—right, no appearance in 12 minutes. Left, no appearance in 12 minutes.

Resumé: 1. Enlarged and congested verumontanum.
 2. Trabecular hypertrophy (slight) of bladder.
 3. Both kidneys of functionally insufficient.
 (Drs. B. A. Thomas and J. C. Birdsall.)

4/26/25. Condition essentially the same. Jerking movements of the hands and "indigestion"—due to chronic uremia.

P. S. P. Output: 4/14/25. 1 cc. dye in 20 cc. saline intravenously.

3%.....first hour } ...8% total two hours
 8%.....second hour }
P. S. P. Output: 4/28/25. 1 cc. dye in 20 cc. intravenously.
 3%.....first hour } ...11% total two hours
 5%.....second hour }

Blood Count: 3/23/25. R. B. C. 2,820,000
 White B. C. 4,600
 Hb. 60%

Extremities: Right femur and bones of forearm are thickened and bent. Some limitation of motion in right hip and in elbows. Other bones and joints are O. K. Muscles of fair tone and development.

3/15/25. Mass beneath left clavicle apparently pulsating, not expansile, but giving a distant bruit-like sound on auscultation.

Heart: A roughening of the first sound at the apex. Accentuated aortic second sound.

180
B. P.: — in both left and right arms. Action full and bounding.
 100

3/25/25. **Prostatic Slide:** Negative.
 Passed sound No. 22 easily.

One ounce residual urine.
 Topical application 20% agno₃ to verumontanum. (J. C. Birdsall.)

Impressions: 1. Chronic nephritis without edema, with hypertension and cardiac hypertrophy.
 2. Possible aneurism of left subclavian artery (?).
 3. Hypertrophy of prostate.
 4. Osteitis deformans.
 5. Pulmonary fibrosis (?).

Case No. 20

George H.: Philadelphia, Pa. Service of Dr. A. A. Stevens. Men's Medical Ward 336, Philadelphia General Hospital. Interns: Drs. W. A. Rourke and Harvey.

White man, aged 64 years. Admitted May 11, 1926.

Chief Complaint: Weakness and cough.

Occupation: Lumber man and also worked in a brick yard.

Family History: Unimportant. Father and mother died in old age. One brother, one son and wife living and well. Two sisters died of tuberculosis.

Past Medical History: Had measles and whooping cough. Denies rheumatism, pneumonia, typhoid fever, tonsillitis, chorea, scarlet fever. Had gonorrheal urethritis when young.

Examination: Poorly developed white elderly man of about 65 years of age. Marked enlargement of the head.

Eyes: }

Ears: } Negative.

Nose: }

Teeth and Gums: In poor shape.

Neck: Negative.

Chest: Poorly developed. Many scattered acne lesions. Expansion diminished. Tendency to hyper-resonance all over, except empyema (encapsulated) left hemi-thorax.

Heart: No thrill, no shock, no murmurs.

Blood Vessels: Sclerotic.

124 S

Blood Pressure: 60 D

Abdomen: Negative.

Liver and Spleen: Not felt.

Extremities: Bowing of tibiae.

Impressions: *Paget's disease of the bone*. Chronic bronchitis, diseases tonsils, general arterio-sclerosis, broncho-pneumonia, pulmonary T. B. (?), empyema.

5/14/26. **Blood Chemistry:** Sugar (67 (?) mgm., urea—n. 12 mgm., uric acid 3.2 mgm.

Blood Wassermann: Negative (all antigens).

Blood Count: R. B. C. 3,860,000; W. B. C. 10,700,000; H. B. 11.1; Polys. 82%; lymphs. 16; L. and Trans. 2; moderate anisocytosis, occasional poikilocytosis.

5/15/26. **X-ray:** No. 32556. Skull—osteitis deformans (Dr. E. B. Holmes).

X-ray: No. 52026. Encapsulated empyema, left hemi-thorax, right chest normal.

5/11/26. **Urine Analysis:** 1.023, neutral, no albumin, no sugar.

5/26/26. **Urine Analysis:** Acid, 1.028, amber, no albumin, no sugar.

Sputum: No T. B. found.

5/25/26. Transferred to surgical ward for treatment of empyema, by drainage.

Cases 21, 22 and 23

On August 10th, 1924, I saw a case of osteitis deformans in a white man (Meyer E. S.) of about 56 years of age at Atlantic City, N. J., at a Beach Front Hotel. However, I did not have an opportunity to make a thorough study of this patient. Clinically, however, he appears to be a typical case of *Paget's Disease*; he has the characteristic marked enlargement of the head and the bowing of the lower extremities, etc.

I also saw a patient with osteitis deformans recently—a white man, past fifty years of age, who runs an elevator in a county public building in Camden, N. J.

There was also a former patient in the neurologic service of the Philadelphia General Hospital, Dr. J. W. McConnell's service,—who now runs an elevator in this institution (Richard C., white man, aged 48 years), that appears to be a case of early Paget's disease.

Conclusions and Summary

1. I have now reported a total of twenty cases of osteitis deformans. Seven of these cases are reported in this (third) paper. Two or three other cases I have seen, in white men, at or past fifty years of age, which I have not studied nor examined thoroughly, as yet.

2. Most of the patients with advanced osteitis deformans are men past fifty years of age. The condition similarly affects women, in the same period of life.

3. There is some degree of deafness in nearly all the cases.

4. Most of the patients show marked arteriosclerosis.

5. Almost all of them that I have studied, have negative Wassermans—showing no relation to syphilis.

6. Nearly all of my reported cases had involvement of the skull, tibiae, femora and other bones.

7. All of them showed normal or nearly normal blood-sugar, blood-urea, and blood-uric acid—except where there was also present advanced kidney disease.

Basal metabolism studies were not made—but I doubt if anything would be learned from this procedure, in Paget's Disease.

8. Nearly all of them have had "rheumatic pains"—off and on, for many years—before the typical advanced picture of Paget's disease was noticed.

NOTE: I am appending the autopsy protocol in the case of Edward S. (Case XIII, MEDICAL TIMES, N. Y., Vol. II, No. 3, March, 1924, p. 58.) The autopsy records in Case II (William S.), appeared in MEDICAL TIMES, N. Y., March, 1924, and the autopsy reports in Cases IV (Joseph Frey), V (Margaret Calhoun), and IX (Henrietta Nichols) appeared in MEDICAL TIMES, N. Y., November-December, 1922.

Autopsy Report

Pathological Laboratory, Philadelphia General Hospital

Case XIII. Edward S.: Autopsy No. 16,808—performed 18 hours after death by Dr. E. Case. Service of Dr. S. S. Cohen; and Dr. LeFavor, interne.

Admitted 6/21/23—died 1/28/26 at 9 P. M.

Clinical Diagnosis:

Paget's disease.
Chr. myocarditis.
Bacteriological Diagnosis:
H. B. Staph. albus.

Gross Anatomical Diagnosis:

Bone: Osteitis deformans.
Heart: Hypertrophy; dilatation; chr. mitral and aortic valvulitis.

Thorax: Unilateral hydrothorax.

Lungs: Edema.

Spleen: Congestion and enlargement.

Kidneys: Passive congestion.

Liver: Peri- and multilobular cirrhosis.

Brain: (tentative) 1. Arteriosclerosis, marked. 2. Softening, multiple areas; rt. lenticular, lt. occipital and parietal. Smaller scattered areas. 3. Edema. 4. Pia-arachnoid, thickened. 5. Ventricular dilation. 6. Spinal cord, soft and thin.

Cause of Death: Paget's disease of bone.

Autopsy No. 16,808. Edward S.:

External Examination: Body is that of an elderly white man, with a very large head, broad pelvis and marked bowing of the right lower extremity with lateral flattening of the bones of the leg. Left leg does not seem to be nearly as much involved. Shoulders are relatively narrow and back is rounded. Body is opened in the usual manner.

Histological Diagnosis:

Bone: Paget's disease.

Heart: Arteriosclerosis with calcification; myocardial degeneration; chr. endocarditis, mitral.

Lungs: 1. Chr. adhesive pleurisy. 2. Emphysema. 3. Congestion.

Spleen: Congestion.

Kidneys: Chr. diffuse nephritis. Arteriosclerosis, congestion.

Liver: Cirrhosis biliary, passive congestion.

Brain: 1. Marked arteriosclerosis. 2. Multiple areas of softening.

Pancreas: Chr. interstitial pancreatitis. Arteriosclerosis.

Lymph Nodes: (3) Subacute infectious lymphadenitis.

Skin is covered with numerous small dark red spots and scratch marks.

Internal Examination: Peritoneal cavity is free from fluid. Left pleural cavity is practically obliterated by fibrous adhesions. Right pleural cavity contains about 1400 cc. of clear straw colored fluid. No adhesions present.

Pericardium: Contains about 200 cc. of slightly blood stained fluid. No adhesions are present.

Heart: Organ is large and firm. Right ventricular cavity is considerably enlarged; wall is thickened and mural endocardium is smooth. Toward the apex of this ventricle there are white spots, due to thickening of the mural endocardium. Chordae tendineae are unusually large and firm; pulmonic valve is of good size but leaflets are thin and normal in appearance. Tri. valve meas. $13\frac{1}{2}$ cm., pulmonic 8, mitral $11\frac{1}{2}$, aortic 7. Right ventricle meas. 9 mm. in thickness, left 22 mm. Tricuspid leaflets are only slightly thickened. Right auricle is dilated; mass is smooth. In the appendix there is some thickening of the endocardium; near the right ventricle it is quite extensive. There is a sealed like communication between the 2 auricles at the foramen ovale, but it is well protected by flabby endocardium. Left ventricle is only moderately dilated. Papillary muscles are large and firm. Mural endocardium is smooth and transparent, except at the tips of the papillary muscles, where it is distinctly thickened.

Mitral leaflets appear, posterior ones, quite thick and in this latter leaflet there is a calcareous deposition. About the middle of the anterior leaflets, extending to the edge of the valve there is a rounded eminence, about 1 cm. in diameter. On section this is found to contain a soft white material about the consistency of soft cheese. It seems to be encapsulated. There is no evidence of acute inflammation of this valve. In the formation of this nodule, there has been a contraction of the leaflet. Aortic cusps are stiff and protrude, due to the presence of large numbers of calcareous patches on the aortic side. Coronary artery shows a very moderate grade of atheromatous change, with occasional calcareous patches. Muscle tissue is firm; dark red in color. In the left ventricle near the apex, there seems to be some excess of fibrous tissue. Left auricle is dilated but not as much as the right.

L. Lung: Covered with thickened pleura, which is edematous. Organ is heavy. Cut surface is moist, dark red in color; on pressure considerable frothy fluid exudes. No consolidation found.

R. Lung: Surface is smooth and moist; organ is heavy; cut surface is dark red and moist. No consolidations found; on pressure considerable frothy fluid exudes.

Spleen: Measures $13\frac{1}{2} \times 7 \times 5$ cm. Bluish slate color; firm; cut surface is dark red and bloody. Neither trabeculae nor follicles are unusually prominent.

Adrenals: Are not very large but are firm. There appears to be approximately the normal proportion of medulla and cortex.

L. Kidney: Measures $13\frac{1}{2} \times 7 \times 4\frac{1}{2}$. Quite firm; capsule strips with some difficulty, leaving a bluish red, uneven surface, in which an occasional minute retention cyst is found. There are a number of depressions, due to loss of kidney tissue and subsequent retraction. Tissue between is finely granular. Cut edge is sharp. Cortex is regular in thickness, measures from 4 to 6 mm. Pyramids are darker in color than cortex, but entire surface is dark red. Walls of blood vessels are thickened, making them quite prominent. Pelvis presents no evidence of inflammation.

R. Kidney: Measures $13 \times 5 \times 4$ cm. Resembles its fellow in all essentials.

Ureters not diseased. Bladder is contracted and contains a small amount of urine.

Esophagus: Is not diseased. Stomach: Is quite large and contains fragments of meat and vegetable material. Mucous membrane is dark red and soft. Bile ducts are patulous.

Intestines present no external evidence of disease. Pancreas is firm and pink in color.

Liver: Measures $32 \times 18 \times 9\frac{1}{2}$ cm. Very uneven and bumpy and a mottled reddish brown, with irregular thickening of the capsule, having the appearance of involving the peri-lobular connective tissue of the lobules just beneath the capsule. Organ cuts with some resistance. It is quite tough. Cut surface when compressed slightly shows distinct projection of the softer liver lobules with retraction of the peri and multiple lobular fibrous bands.

Gall Bladder: Contains golden yellow bile; wall is thickened; mucous membrane is marked by a large number of minute soft elevations.

Aorta: Shows a moderate grade of atheroma with occasional patches of calcareous precipitations.

Skull: On removal of scalp, surface of skull is found to be very uneven and marked by a number of dark red areas, some of which the point of the knife penetrates and they prove to be areas of softening. SKULL CAP, anteriorly, measures 37 mm. in thickness, posteriorly 24 mm. There is MARKED THICKENING OF

both the outer and inner tables, but they are of regular thickness and not sharply defined as in a normal skull. Between the tables, bone is very soft. On the sides of the skull the bone is denser. Posteriorly there is an irregular cavity just beneath the outer bony covering, which contains a bloody, frothy material and is fully 15 mm. long. The inner surface of skull has a peculiar roughened, or finely granular surface. The depressions in the blood vessels are extremely deep. This condition involves the rest of the skull, particularly at the base. There is a marked thickening in the region of sphenoid bone, which by pressing upward has flattened the optic chiasm; in fact all the bones at the base of the skull show similar changes with the formation of heavy round ridges, which are the accentuation of the normal markings. This has ulcerated, involving the cerebellum, pons and medulla. Dura is thicker than normal.

Bones of the spinal column are also much enlarged. Upon sawing through, one shows the same softening with the presence of dark red bloody material.

Spinal Column, particularly in the DORSAL and LUMBAR PORTIONS, the CLAVICLE, BONES OF UPPER AND LOWER EXTREMITIES and the pelvis are all involved in this process and probably other bones. The only bones sectioned are the skull and the vertebrae.

Brain Removed: Weighs 13.80 Gms. Section from the lymphnodes, neck of the gall bladder, section of the vertebrae, heart, lungs, spleen, kidneys, adrenals, liver, pancreas, retroperitoneal lymphnodes and lymphnodes from the region of the gall bladder.

Histology: Dr. W. P. Belk.

Bone: There is more fibrous than osseous tissue. The fibrous tissue near outer surface is rather dense and hyaline and in this is no bone. Deeper there is a very delicate fibrous tissue with a fair number of new connective tissue nuclei and a considerable number of small blood vessels. Here are a number of giant cells with 5-20 nuclei. A few lymphocytes and plasma cells are noted. Near the bony fragments are larger cells, either osteoblasts or osteoclasts. The bony fragments are well formed and as nearly as can be judged, newly laid in some cases. In others an eaten edge denotes absorption. In places a more dense collection of various cells resemble bone marrow. The marrow proper is normal, but of the cellular cavity.

Heart: A section of what corresponds to the mitral valve as described consists of thickened epicardium in the center of which is a degenerated granular material undergoing calcification. In this are cellular areas, not unlike those in rheumatic lesions. No evidence of a more acute process.

Neuropathology: Dr. Winkelman. January 29th, 1926.

Gross Descriptions:

Specimens: 1. Brain weighing 1380 gm.

2. Spinal cord.

Brain: The specimen is so soft in consistency that it settles out and looks larger than it actually is. The convolutions of the cerebral hemispheres are flattened, evidence of intracranial pressure.

The basal vessels are fibrotic and sclerotic with plaque formation. The vessels are large.

Section of the hemispheres is made in vertical planes from front to rear.

The piaarachnoid over the frontal lobes in seen to be definitely thickened and clouded on section. The ventricles are markedly dilated. There are definite areas of softening limited to the right lenticular nucleus and there are areas of softening in the left parietal and occipital lobes, with smaller areas of softening scattered throughout. The dura shows no changes except markedly dilated vessels which amounts to an aneurysmal dilatation.

Neuropathology: Dr. Winkelman.

Spinal Cord: It is extremely soft and very thin. The dura is thin.

Sections taken for stock:

1. Pituitary and all glands of internal secretion.
2. Right and left frontal.
3. Whole vertical section.
4. Left occiput.
5. Medulla.
6. Cerebellum.
7. Spinal cord, 3 sections—a. upper.
b. middle.
c. lower.

Gross Diagnosis:

1. Arteriosclerosis, marked.
2. Softening, multiple areas, rt. lenticulae; left occiput and parietal, smaller scattered areas.
3. Edema.
4. Pia arachnoid thickened.
5. Ventricular dilatation.
6. Spinal cord softened.

February 10th, 1926.

Sections taken for study:

1. Left frontal.
2. Left basal ganglion with softening.
3. Left motor.

4. Left occipital.

5. Medulla.

6. Spinal cord, 3 levels.

Stains: Teluidin Blue.

Sections of ductless glands stained with B and B, also section of decalcified bone.

March 29, 1926.

Microscopic Description: Pia arachnoid definitely thickened and fibrotic but without infiltrative elements.

Cortex: General plan of architecture maintains but definite loss of ganglion cells, especially foci. There are chronic sclerosing and changes in the ganglion cells as well as calcareous deposits in them. Much amyloid body formation at cortical edge. The blood vessels—the larger ones show marked atheromatous changes, the smaller ones thickening of walls. Areas of softening are to be found, but only with careful search.

Spinal Cord: No tract changes are visible. The anterior horn cells show definite morphologic changes. They are not reduced in number but show vacuoles in the cytoplasm and general uniformity in staining.

Microscopic Diagnosis: 1. Marked arteriosclerosis.
2. Multiple areas of softening.

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Treatment of Congenital Syphilis with Bismuth

Tudos considers the introduction of bismuth in the treatment of congenital syphilis a step of paramount importance. Injections are given every third to fourth day. The treatments were well received. Control of the urine and hygiene of the mouth in older children are advisable. Bismuth influences the Wassermann reaction. The author is of the opinion that when salvarsan is of no avail in this connection, bismuth is likewise efficacious. —(Klin. Woch., Dec. 10, 1925.)

The Hallucinations of Myxedema

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Some years ago my attention was directed to an interesting and a rather unusual symptom of myxedema, which was described by Murray in the chapter on Disease of the Thyroid Gland, in "Twentieth Century Practice of Medicine," volume IV., 1895. The following is a quotation taken from this article: "Hallucinations of both sight and hearing are frequent in the more advanced stages of the disease; thus a human being or an animal may be seen, a familiar voice may be heard, or a sound as if someone had opened the door and entered the room in which the patient was sitting. In some cases the patient is only conscious of seeing some ill-defined object flitting across the room, but is unable to state what it was. In others the hallucinations are extremely clear and distinct. For example, one of my patients told me that after the death of her father she distinctly saw him on several occasions walk into the room and sit down at her bedside, and on one occasion she heard him say, distinctly, 'A-hinny (a Northumbrian term of endearment), you are getting too fat.'"

For years all of my patients presenting symptoms of thyroid deficiency were carefully studied in regard to the above mentioned visual and aural hallucinations. As many individuals suffering with myxedema have various forms of hallucinations, it is not always practical to enumerate the whole group in writing a summary of the history. Therefore, for the sake of simplicity we usually designate them, Murray's Hallucinations or Murray's syndrome.

In a review of one hundred and ninety-four consecutive cases of thyroid deficiency, in which are included the milder forms as well as the outspoken cases of myxedema fifty-one or twenty-six per cent manifested some form of hallucination of sight and a small group, hallucination of hearing such as have been described by Murray.

The most common form of visual hallucinations in myxedema is that in which patients see small animals, generally mice, sometimes rats, cats or dogs running on the floor. There were twenty-six of these cases in the series, eighteen of which complained chiefly of mice. In several of the cases, cats and dogs also appeared although at less frequent intervals. In other instances no mice were seen, but the hallucination took on the form of a rat, cat or dog. These symptoms manifest themselves at intervals. When once well established they may recur daily or a number of times during the same day. They are always transient in character and appear to be superinduced by a sudden rotation of the head or a lateral glance to one or the other side. Patients possessed with these hallucinations describe the course and direction the animals take in their movements in exactly the same manner. That is, they make their appearance directly in front of them, usually on the floor and pass obliquely outward and backward to either the right or the left until they vanish in space. Frequently they appear so real that they produce a vivid impression upon the patient's imagination. For example, one of the patients—a woman—often screamed and jumped up on a chair when the hallucination of a mouse running on the floor occurred. Another woman with well-marked symptoms of myxedema was so much annoyed with "mice" that she actually set traps for them. It was ascertained on careful inquiry that she was suffering

from hallucinations similar in form and character to the one just referred to.

The following experience was related by another patient. In her hallucinations she saw a mouse passing in the usual direction and disappear, as she thought under the furniture or behind the radiator. Her maid, who was directed to make a search for the mouse was unable to find it. Further inquiry revealed the fact that she had other definite hallucinatory disturbances.

One of the patients in this group who was subject to seeing various animals, notably rats, mice, cats and dogs, on one occasion while eating got up from the dining-table to feed the dog. Much to her astonishment the dog suddenly vanished. This patient, also at times experienced the feeling as if someone was walking or standing behind her, a manifestation which is not uncommon. There are all sorts of mysterious and grotesque phenomena which may occur. In one instance the patient saw at frequent intervals silver balls the size of finger tips, in addition to hallucinations of small animals as well as human beings.

An interesting case is that of a man, who, on numerous occasions thought he dropped some object, but in attempting to pick it up from the floor discovered it was only a shadow as he described it. Other patients had difficulty in identifying the object with any animate form, although they invariably have the same fleeting character and pass in the same direction from front, outward, and backward.

Sometimes these visual disturbances take on the form of illusions, thus patients may see pictures distorted and move on the wall; or they may have the sensation of the floor becoming uneven which causes them to have difficulty in walking and even fall occasionally on a level surface. There were several patients who complained of a curious intermittent sensation when walking on a street pavement, of a wave-like motion of the pavement so that they were actually obliged to sit down on a door step or lean against some object until the sensation passed off.

Visual and aural hallucination are often associated in the same individual in addition to other alterations of psychic functions, as the following abstract from the history of a patient suffering with pronounced symptoms of myxedema will illustrate.

Mrs. B., aged 48, married, frequently complains of left supra-orbital headache. She sleeps poorly and is mentally and physically sluggish. Her memory being impaired for recent events, she often misplaces things. She also complains of *muscae volitantes* and visual and aural hallucinations. Often at night she imagines that flies and bugs are in her bed causing her to scream and call for members of the household to turn on the electric light and look under the covers in quest of the insects. In a short time the hallucinations cease when she realizes that the whole episode was a myth. During the day she has frequent visions of cats, dogs, mice and rats running on the floor. There are times when objects appear in halves, like human faces. Sometimes she feels the sensation of the floor upon which she walks give way or the pavement move in a wavelike manner resulting in a tendency to fall and necessitating her to interrupt her walk and stand still or hold on to some

(Concluded on page 203)

Coffee in Health and Disease

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A craving for novelty, for change, to be or feel different seems universal. As a good reason can usually be found for things which happen regularly, so this craving appears to be in some way related to an urge in Nature to escape from hereditarily imposed standards; which urge makes for new inventions and discoveries and for adaptation to changed environments, and is a factor in the scheme of evolution.

All peoples sufficiently advanced in culture to know how, more or less use drugs which stimulate, narcotize or intoxicate in order to gratify, this craving. To what extent this practice has favored evolution cannot be definitely determined, but that it is possible for it to have had some effect in that direction seems to be an *a priori* deduction. The part played by these agents in stimulating the productiveness of genius is recognized; and also well known are the destructive effects of these agents when used to produce changes in excess of the range of safe variation which Nature established when she set her evolutionary pace; that pace is slow; Nature's law is change, but the corollary is that the change must take place very gradually.

Of these stimulant, narcotic and intoxicant drugs the most extensively used in caffeine: in tea by the Mongolian millions almost universally; in guarana and maté by millions in South America; in the kola nut by natives of Africa; and in coffee by the civilized world generally. In the year 1924 1,388,203,950 pounds of coffee were consumed in the United States, which means 12.38 pounds for each man, woman and child.

The coffee plant, known in botany as *Coffea Arabica*, is a native of Africa. It was introduced from Abyssinia into Arabia, and in the latter country its use as a beverage can be traced back more than four hundred years. It became known to western Europe about the middle of the seventeenth century.

Coffee contains caffeine, caffeeo-tannic acid, fat, carbohydrates, albuminoids, essential oils and minute quantities of volatile oils. Subjected to the action of heat in roasting it develops an aromatic substance, caffeeol, which gives it its peculiar fragrance. Its characteristic effects seem to depend chiefly if not entirely on the caffeine. It has been claimed, that some of its effects are due to the caffeeol, but the evidence is contradictory. "Decaffeinized" coffee seems to be well borne by many who cannot take whole coffee without bad effects, which would favor the view that the caffeeol is of negligible importance. But on the other hand, tea, which contains abundant caffeine, is considered by many to be less exhilarating than coffee and less disturbing, which would suggest that the constituents other than caffeine may play some part.

Caffeine is classed chemically with the purins, with the nitrogenous waste substances of the body—the meat extractives, substances found in beef tea, as hypoxanthin, zanthin, guanin, adenin and uric acid. It is known in chemistry as tri-methyl zanthin.

The following general statements regarding the effects of caffeine in the body seem to be warranted.

// As a toxin, a poison, it can disturb the life activity of all the tissues, but like most toxins, it has a selective effect on particular tissues. It may in some cases or in large doses irritate the lining membrane of the stomach, producing a sensation of heat and burning in the pit of the stomach; or possibly this action may be produced by stimulation, as by a purin, of the secretion of the hydrochloric acid of the gastric juice. It has a reputation for causing "biliousness", which might mean that, as a poison and also as belonging to the class of waste substances with whose management the liver is regularly occupied, it produces more or less exhaustion of the detoxicating function of the liver. On the glands of internal secretion its effects are not well known, but it is reasonable to suppose that it stimulates the thryoid gland (that regulator of the human furnace) like the meat extractives; and it has been observed in experiment to produce in some cases increased excretion of carbonic acid, which means increased combustion. On the muscular tissues it may have some effect in increasing excitability, but it does not seem directly to increase their contractile power; it seems not to be a true heart stimulant. On the excreting tissue of the kidneys it has a stimulating effect; it is an effective diuretic, as would be expected of a substance which is closely allied chemically to the waste products whose elimination is the regular business of the kidneys. On the nerve centers it has a strong stimulating effect, and this is its most notable, its characteristic effect. The great aggregation of nerve centers in the brain, and the vagus and sympathetic nerve centers which control so many bodily functions, constitute its special field of action.

The effect of coffee on the brain, in moderate doses and in average people, is to produce a feeling of well being and increased mental power. The sense impressions, as of sound and sight, are made keener; music may be better appreciated. The rapidity of the association of ideas is increased and the processes involved in thinking are quickened; the attention is more easily fixed and held; sustained mental effort is less fatiguing. But although mental productiveness is increased, so to speak, by coffee, the quality of the output is not necessarily improved; for the mental activities involved in broad vision, criticism and judgment do not seem always to be favorably affected to a corresponding extent.

With large doses the activity of the brain cells responsible for the processes of thinking may be so increased, or so unevenly increased, that coordination is impaired and the critical faculty rendered more or less incompetent, with resulting confusion of thought. Also, the excitability of the cells may be so heightened that sleep is disturbed by bad dreams or sudden "startings", or insomnia develops; or there is mental depression or a state of apprehensiveness; or there is dizziness, ringing in the ears, or blurred vision, or in extreme cases there is delirium. Its continued excessive use can produce a condition of over-excitability of the nerve centers which makes for their easy exhaustion and the development of neurasthenia.

The effects of coffee on the circulatory apparatus seem to come through its stimulation of the vagus and sympathetic nerve centers which control that apparatus; stimulation of the vagus relaxing and slowing, and that of the sympathetic doing the opposite. If these controlling nerve centers are subnormally active, then it is conceivable that caffeine in proper doses can be of benefit in improving the circulation; but if they are in a normal condition its effects on the circulation are not apparent if the dose is not excessive in relation to the natural compensating power. In excessive doses the circulation may be so disturbed that it is maintained with evidences of strain, such as an abnormal rate or rhythm of the heart beat, varying blood pressure, or abnormal subjective symptoms; palpitation of the heart and feelings of oppression or pain in the chest are common symptoms of excessive use of coffee.

The effect of coffee on the respiration is to increase its rate through stimulation of the controlling nerve centers.

Through vagal and sympathetic stimulation coffee can affect the alimentary tract, acting usually as a laxative.

On the general muscular system its effects can be accounted for by stimulation of the motor nerve centers in the brain rather than by direct action on the muscle cells. In moderate doses it seems to increase muscular power and to lessen fatigue. In large doses it may cause tremulousness or muscular incoordination; a person typewriting, stimulated with coffee, may make more mistakes than usual, although able to work faster.

The effects of coffee vary greatly in different individuals and in different ages and in different conditions of health and disease. Some seem able to take it and in quite large quantity without noticeable or immediate bad effects. The young and healthy have generally a greater tolerance for it than the old. Abnormal irritability of nerve centers may render the subject unduly susceptible to it; as a result of arteriosclerosis, high blood pressure, poor circulation, infective or other toxemias or functional overstrain, the brain cells may become so irritable that small doses produce insomnia and mental disturbances; similarly the nerve centers controlling the circulatory apparatus may become so intolerant that that it easily produces palpitation or feelings of oppression or pain in the chest. If the kidneys are diseased so that their ability to excrete purin, including caffeine, is lessened, it may be badly borne.

The use of coffee in medicine is suggested by its effect in stimulating the activity of nerve centers; it can be used to increase the excitability of those centers when rendered subnormal by disease; as in some conditions of the circulatory apparatus and in some brain conditions with depression; it may temporarily relieve brain exhaustion and headache; it is a valuable remedy in the condition of shock, in which there is acute depression of the nerve centers. A clear indication for its medicinal use is seen in opium poisoning, in which there is great depression of the nerve centers, particularly in the brain.

The question of the non-medicinal use of coffee, of the propriety of its use as a stimulating beverage, would seem to depend for its answer on the principles suggested in the beginning of this paper. If such use is in harmony with Nature's plan of evolu-

tion it would seem to be justified. The question in that case becomes one of regulation.

It is obvious that some people should not drink coffee at all, viz: those who easily get bad effects from it; always the very young; often the old; those who have disease of the kidneys and often those with heart disease; those whose blood pressure is very high; those whose brain cells are unduly susceptible to its effects, as shown by insomnia, mental depression and irritability; those whose vagus and sympathetic nerve centers are easily excited, that is, "nervous" people generally—these are among those who should not as a rule, drink coffee. Nor should those drink it who can not do so in moderation.

The nurse who takes coffee to keep herself awake while on night duty, instead of getting enough sleep during the day, and the student or brain worker who takes it to enable him to do an excessive amount of work instead of to enable him to do his work more easily, misuse it; and so does anyone who takes it when it disturbs unpleasantly or injuriously the regular order of his life.

Because coffee is injurious to some people and in some conditions, and because it is often abused, fanatics who have that "thought without knowledge" which Confucius calls dangerous, might be inclined to forbid it altogether. The wise conclusion seems to be, that this cup which cheers and only mildly inebriates, which adds to the joy of living and may help on evolution and human progress is entitled to a place, though a qualified one, in our existence.

1218 Pacific street.

Myxedema

(Concluded from page 201)

object. In addition she is subject to aural hallucinations. She hears voices calling her name, footsteps coming through the doorway or someone opening the windows. Her son keeps his automobile in the backyard. Almost every night she hears someone start the motor and run the automobile through the driveway. Her husband, who has to make an investigation before she can go to sleep, always finds it where it was parked. She is always apprehensive, too timid to ride in an automobile and frets over inconsequential. Thus she describes the effects of a visit to her physician, who, being unable to see her immediately aroused in her a suspicion that he did not care to treat her. So she went home without seeing him and brooded over the incident until she became "panicky," when she had to send for him. This condition has existed for about five years.

In order to ascertain the history of hallucinations in this class of cases, careful inquiry must be made in regard to them, as patients reluctantly volunteer the information.

Despite the fact that this symptom is unusually interesting and is almost, if not absolutely pathognomonic, it appears from a search of the literature that it has been either neglected or almost entirely overlooked. The results of these studies indicate that this syndrome is of considerable diagnostic value. The diagnostic proof resides in the fact that feeding of small doses of thyroid (half to one grain three times a day) over a period of three or four days, will almost invariably dispel the hallucinations.

St. Paul and 23rd Sts.

IS TUBERCULOSIS CONQUERED?

JACQUES W. REDWAY,
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In the progress of the campaign against communicable diseases the doctor has wrought a most creditable showing. The statistics of a lowered death rate are so well known that it is not necessary to rehearse them. Taking diphtheria as one example, the Schick test and the antitoxin treatment will certainly reduce the death rate of a one-time scourge to a minimum. It may eliminate the disease; but it makes humanity immune and not resistant.

The conquest of the yellow fever is another instance of the triumph of medical science. Here the case is clear-cut. A mosquito communicates the disease to the man; the infected man communicates the disease to the mosquito. They are complementary carriers. Extermination of either means the possible extermination of the other—possible, because Dame Nature sometimes makes unexpected short cuts. For obvious reasons, however, humanity has decided upon the extermination of the *stegomyia* mosquito. By the process, incidentally, humanity is none the stronger, none the more resistant. It is not even immune; it is merely protected by dodging behind a screen.

An interesting discovery, new to me but probably not to epidemiographic science, is the impulse of this article—namely, that the drop in the death rate of tuberculosis began before the organized campaign against the disease was instituted. As a matter of fact, the lowering of the death rate seems to have progressed not altogether because of the campaign but in spite of it. Moreover, succeeding years indicate that the campaign has not been more effective than was Dame Nature. Indeed, in parts of central Europe, since 1918, there has been an increment in the death rate from one of humanity's greatest scourges. The figures are incomplete and I do not quote them. Nevertheless, they seem to be fairly conclusive.

But 1918 was the year of the influenza pandemic, and one might argue that the weakening effect of the disease gave tuberculosis a better chance at its victims. This is certainly true; moreover, it gets to the bed rock of the case. Modern methods do not make humanity more resistant against tuberculosis; they merely attempt to protect it against the disease. Perhaps a serum treatment may procure immunity, but most assuredly it does not procure resistance beyond that of the individual treated thereby. The great feature in the progress of medical science has not been the creation of greater resistance to tuberculosis; it has been mainly the creation of protection against it. And certainly the protection accorded is better than no protection at all; but protection without the creation of resistance in the long run means not only a future weakening of the race; it means a constantly increasing weakness. A pathologist—I wish I knew his name—has said, "A strong race is a resistant and not a protected race." And jungle methods, which provide for the sacrifice of the weaklings and the unfit, will produce racial strength, while society will certainly pay roundly for the perpetuation of the inherited tendencies that invite disease as well as to continue the existence of criminal tendencies.

I am on record in saying that the conquest of tuberculosis is in sight. After a more careful study of the statistics of the disease I am not so cock-sure that I am right. Protection against the yellow fever, or the bubonic plague, or the Asiatic cholera is brought about by arresting or by destroying the carriers of the disease. But the carriers of tuberculosis are legion in number, and they are always with us. Moreover, the environments of the white race is saturated with the micro-organisms of the disease. Almost all humanity is exposed to infec-

tion. Most of humanity resists infection or overcomes it. Ninety thousand a year or more in the United States succumb. The real remedy is obvious—namely, medical science must turn to the evolution of resistance and abandon protection except as a temporary expedient. Racial strength and, to a certain extent its existence, rests on three legs—health, morality and education. Two of these legs seem to have collapsed. The first-named may have needed splints and glue; on the whole it has not flunked its responsibilities.

Meteorological Laboratory.

Half of Blindness is Preventable

"Half of all blindness is preventable," declared Dr. Park Lewis, eminent ophthalmologist of Buffalo, N. Y., and Vice-President of the National Committee for the Prevention of Blindness, in an address before the St. Louis Chamber of Commerce. "This is so," Dr. Lewis said, "despite the important reductions in both the frequency and severity of some of the principal causes of blindness resulting from the organized and nation-wide campaign for the prevention of blindness which is now in its 11th year. The total amount of blindness and half sight, however, is growing proportionately less."

Speaking on the economic necessity for conservation of vision, Dr. Lewis pointed out that the cost of educating a blind child is at least 10 times that of educating a normal sighted child. As further evidence of the heavy cost to industry resulting from accidents and diseases effecting the eyes, he declared that in New York State alone close to \$1,000,000 is paid as compensation for eye injuries in a year and that almost an equal amount is paid by the employers of Pennsylvania each year.

"In considering the economic phase of the subject," Dr. Lewis said, "we are not thinking of the frightful loss to the man in the moral suffering which he incurs, in the dependency which necessarily follows from the loss of his own self efficiency, neither are we considering that long line of related losses which enter into the question, such as his inability to provide for his boy who would otherwise have gone to college, the young daughter who is sent out to work when she ought to be in school, the invalid wife who is deprived of the necessities that she ought to have and other relative conditions which you can easily imagine but which I need not express."

"There is not a loss suffered by any individual member of a community," Dr. Lewis added, "that is not in some degree shared by every other member. I think then that it would be agreed that in industry today, it is a matter only of forethought and business acumen to so plan each factory and workshop that the greatest returns are produced with a minimum of loss, that the most serious loss that can be sustained is the irreparable injury of the most valuable implement in the shop, the workman, that the average workman is apt to be careless of his own interests and he needs to be guided in preserving them, that the loss when sustained is a triple one, first and most serious to the man himself who is thereby handicapped for the remainder of his life, and who if he works must thereafter work at reduced pay; second, to the employer who has to pay the price either through insurance or otherwise or he may lose the services of a valued and skilled workman, and third, to the commonwealth."

"Helen Keller, that prodigy of our age with a keenness of intelligence and clearness of perception possessed by few of us who have all of our physical senses, said some years ago, that the time would come when we would no longer point with pride to magnificent hospitals and asylums and poor houses, but would bow our heads in humiliation and shame to realize that we had been to such an extent derelict in meeting the obligations which we owed to our fellow men, as to permit the existence of the conditions which make such places necessary. May she not have been in some measure right!"

Nonspecific Protein Therapy in Syphilis With Special Reference to Effects on Wassermann When Used As Adjunct to Neosarsphenamin

Sigmund S. Greenbaum and Carroll S. Wright show that nonspecific protein therapy alone will result in partial or complete involution of secondary and tertiary lesions. When used as an adjunct to neosarsphenamin in the treatment of patients with latent syphilis with strongly positive Wassermann reactions, the influence in reducing a positive reaction to a negative one is more marked than when neosarsphenamin alone is used. The explanation of this is not clear, but it is suggested that the protein therapy serves to stimulate normal protective mechanisms within the body. If this is true, nonspecific protein therapy should prove a valuable adjunct to the usual antisyphilitic remedies.—(*Arch. Derm. & Syph.*, Dec., 1925.)

Obstetrics & Gynecology

Radium Treatment of Carcinoma Uteri

Ward and Farrar, addressing the Philadelphia Obstetrical Society on this most important subject, observe that Ewing states that radium acts on cancer cells by autolytic degeneration, caustic destruction, and growth restraint. The principles on which they have based their method of treatment of cervical carcinoma rest on this theory. It is not advisable to use a dosage sufficiently powerful to destroy the normal cells and thus open up portals of entry for a rapid extension of the malignancy. The beneficial effects that they hope to obtain are the result of the death of the cancer cells only, plus the restraining of the growth of those tumor cells which may have escaped, by the interference with the capillary, venous, arterial, and lymphatic circulation, due to the action of the radium on the proliferating connective tissue. The choking off of the blood and lymph supply as a result of contraction following irradiation means starvation and imprisonment of the remaining cancer cells that have been within the reach of the rays. This is in accord with the views of Ewing and McCarty and of Clark and Keene.

An example of this action of irradiation, whereby malignant cells may be isolated and walled in so as to nullify them, is illustrated in a report of a case in the *Annals of Surgery*, March, 1925, by DeWitt Stettin, who did a radical amputation of the breast for a large-celled alveolar carcinoma, followed by a course of x-ray therapy. A nodule developed one year later which had all the appearances of a typical supraclavicular lymph node metastasis. This nodule of the deep-seated glands which was firmly fixed has remained stationary for five years, and the patient is in excellent health. Dr. Stettin believes that the arrest is due to the isolation of the cells by the scar tissue formation as a result of the x-ray application.

The contraction and cicatrization following the healing after radium therapy is well known. The authors believe that this accounts for the fact that the results that have been obtained by observers who only have a limited supply of radium at their disposal (100 to 200 mg.), equal those of clinics where very large amounts are available. They doubt whether the application of massive doses can show any better ultimate results than the intelligent application and reapplication of smaller doses.

They start with the principle that every case of cancer of the cervix is a study in itself, and that there can be no uniform or standard dose for the treatment of all cases. The first dose is regarded as a test dose, usually from 2,400 to 3,600 mg. hours, and they judge of the effect in that particular case by a careful observation of the conditions existing at the end of six to eight weeks. They think they can tell from the general appearance of the growth whether the several stages of hyperemia, local destruction of tissue, formation of local sloughing, beginning healing process, complete healing, and final cicatrization with marked contraction, which represent the phenomena of irradiation of the cervix by radium as described by Farrar are progressing satisfactorily or not. They have tried to learn what the picture should be at the end of each postirradiation month. At the end of the third month they expect to find the markedly contracted cervix and vaginal vault of firm consistency with the pallor characteristic of anemic tissues. Later one may observe ecchymotic spots with slight capillary oozing that is not characteristic of carcinomatous erosion; this is due to superficial shedding of epithelial cells, the result of the dwindling blood supply; is analogous to the ecchymosis we frequently see in senile vaginitis, and should not be confounded with a recurrence.

If at the end of the first or second month they find the post-radiation stages progressing satisfactorily, they do not reradiate at that time. They observe the patient each month and as long as the conditions remain quiescent and symptomless, continue the watchful waiting. Should there be evident unsatisfactory progress in the postirradiation stages during the healing period of three months, or should any sign of rekindling of the malignant process after complete healing manifest itself by an erosion, bleeding, or nodule, they at once reradiate, using a dosage and technic commensurate with the conditions present. In contradistinction to the views of many observers, the experience of the authors has been that repeated irradiations in certain of the advanced cases have been of distinct value. In fact some of their five year cases of this class were apparently saved by three or more reradiations. It is to be noted that many of their reradiations consist of the implantation of needles only in suspicious areas. In their experience the monthly inspection is essential to safety. During an interval of three to six months a recurrent malignancy can gain such headway that a serious conflagration may need to be extinguished. If there is an opportunity to plant a needle at the onset of the recurrence, the problem is much simpler, as the chances of smothering the fire during its incipency are greater.

As they consider it important to study the result of the first or test dose, they do not believe it advantageous or logical to give a series of repeated treatments at short intervals as is done in some

clinics. They require a sufficient time after the initial dose for the changes to take place in order that the character of the response to the irradiation may be judged. One case may require only the test dose to produce satisfactory result; another may require several repeated doses at varying intervals, but not closer than six or eight weeks. We see no other way to avoid over-irradiation with extensive and undesired necrosis of tissues if we do not thus feel our way in each case.

The technic of application that Ward and Farrar employ is similar to that in general use. It is important that a careful vaginal and rectal examination should be made in order that an accurate knowledge of the extent of the disease may be ascertained. A cystoscopic examination is also necessary in advanced cases. Care should be taken, however, to avoid all unnecessary trauma in the bimanual palpation, as there is a distinct danger of a dissemination of the cancer cells beyond the growth. They believe that anchoring of the radium by suture in situ should be done wherever feasible, as it is important to insure the action of the rays in the desired area for the required time. In an earlier case in which the tube was placed in the cervical canal without suture, it was found, when the uterus was subsequently removed, that the tube had evidently slipped out beyond the internal os, as the bulk of the irradiation had been exerted in the body just above the cervix. They employ the brass and rubber screening of the radium tube to filter out the harmful rays, and distance screening with vaginal gauze for the protection of the bladder and rectum. As a rule they prefer the short needle to the long Lee needle, believing it safer and simpler to use with the vaginal packing. As it is necessary for the vaginal gauze to be packed tightly in order to distend the vaginal walls to the utmost to insure proper distance screening, the patient must of necessity be catheterized during the time the treatment is in progress. As this is often difficult on account of the packing, they have found the insertion of a self-retaining catheter during the time of the radium application to be satisfactory to all concerned.

Precancerous Lesions of the Uterus

Approximately 13,000 women died of cancer of the uterus in the United States in 1924, says Palmer Findley, of Omaha, Neb. Appalled by this frightful mortality we ask: "What can be done to lower the death rate?" Cancer is curable if taken in time, but how seldom do we see these cases while it is yet time to effect a cure! Findley has not seen more than three such cases. Frank has found but two cancers of the cervix which could not have been recognized without the aid of the microscope and no less an authority than Schottländer reports no more than 2 per cent of accidental finds in his laboratory work.

Inasmuch as there are no symptoms in the earliest stages of cancer of the cervix, little progress will be made in our efforts to educate the public if we limit our instructions to the admonition to consult a competent physician when suspicious symptoms arise. If we wait for symptoms we have usually waited too long. We must do more; we must admonish women who are passing through the cancer age to seek periodic examinations; not alone for the purpose of detecting cancer in the early stage of its development, but, what is more profitable, to recognize the existence of precancerous lesions. "Prevention is better than cure" is an old adage that strikes us with added force in the consideration of the cancer problem.

No one is so bold as to assume an air of complacency in his management of cancer of the cervix. Most of us have acquired the attitude of Meigs, who said to his students in 1848, "It is enough to make a physician's heart sink within him to make the diagnosis of cancer uteri; for such a diagnosis is *ipso facto* a prognostic of death; and when the physician has made it, and is brought to the point of giving true expression to his opinion, he might be supposed to be as painfully situated as an English judge when he puts on his black cap before the final pronouncement unto death." Meigs was speaking before the days of hysterectomies, x-rays and radium, yet he knew that cancer did not arise from healthy tissues; said he: "There is always an antecedent state of alteration of tissue; a state which lays the foundation for the mild evolution and increase in cells." He believed that the time to cure cancer was before it had become a cancer.

The only means at our command to lower the death rate of cancer of the cervix materially is to attack precancerous lesions in the cervix. The major portion of cancers of the cervix are preventable. These precancerous lesions are well known; they are easily recognized, and by intelligent and diligent management they can be eliminated.

Findley does not believe that uncomplicated lacerations of the cervix constitute a precancerous lesion. Schottländer says he has never seen a cancer develop from the site of a laceration in the absence of erosions and ectropion. While lacerations are frequently associated with cancer of the cervix, observations on the early cancers demonstrate that cancer begins anywhere on the surface of the cervix except in the laceration. Bonney, on the other hand, has never failed to find evidence of a pre-existing erosion in all early cancers of the cervix. Exposure of the deli-

cate columnar epithelium, which forms the surface of an unhealed erosion and of an ectropion, to the irritating acid secretions of the vagina, to the insults of the vaginal walls, and to the constant attacks of microorganisms which abound in the vagina, predisposes to the development of cancer. Erosions and eversion of the cervix constitute potential cancers, and, viewing them as such, our efforts should be directed toward the repair of lacerations and the treatment of endocervicitis, because these are the forerunners of eversion and erosions of the cervix, just as the latter are the forebears of cancer.

There seems to be no consensus of opinion as to what constitutes precancerous lesions of the cervix. Various interpretations have been placed upon the structural changes which antedate the development of cancer in the cervix. Epithelial cells that are enlarged, irregular in size and outline with hyperchromatic nuclei and indistinct border outlines characterize malignancy in the opinion of Schottländer, while Pick looks upon such changes as indicative of regeneration. Ewing goes one step further and says that we are dealing with early carcinoma when to the above features there is added the downward growth of epithelial papillae and definite heterotopia. Rubin is quoted by Ewing as finding many phases of precancerous lesions in old erosions of the cervix where there is proliferation of atypical cylindric and squamous cells, both superficially and in the glands. It is generally conceded that epidermization of the cervical canal does not inevitably constitute a precancerous lesion, but it is from such alterations of the cell structure that cancer usually arises. All will agree with Ewing that, "when atypical hypertrophic and hyperchromatic cells are growing downward from the epidermis or fill enlarged gland alveoli, the diagnosis of beginning carcinoma is justified." It is small wonder that experienced pathologists differ in their interpretations when there is so great an intermingling of squamous and cylindric epithelium on the surface and in the glands.

Thomas Wilson of Birmingham, in speculating on the inception of cancer, says it may be that the precancerous condition is already malignant or that the precancerous condition "prepares the ground, so to speak in which the cancer seeds are enabled to germinate; or, further, it is conceivable that the condition represents the first attempts of the body to protect itself against cancer that is already implanted, or is in process of evolution."

Frank takes issue with Ewing, Schottländer, Shanenstein and Rubin, whom he styles as radical pathologists, who "classify as beginning cancer conditions which, lacking as we do absolute histologic criteria of early malignancy, may as well prove to be harmless epithelial proliferation." Frank protests against the tendency to remove uteri on suspicion only. He says that this tendency "has led to a craze for hysterectomy compared to the Batty craze for oophorectomy of the late seventies," and questions "whether the mortality of complete hysterectomy does not far exceed the problematic prophylactic gain." The confidence of Frank in his diagnostic acumen is revealed in the expression: "A carcinoma is unmistakable and in accord with Liebharch, the writer must insist that, while a specimen may be suspicious, in a given case we are dealing either with a cancer or not." Where doubt cannot be expelled, Frank would counsel watchful expectancy by a competent observer for a few weeks when a new exploratory incision can be made or more definite, though still early, signs develop.

Findley cannot subscribe, either in theory or in practice, to the conclusions of Frank. We occasionally encounter borderline cases which baffle both the clinician and the pathologist. In such cases he believes delay to be hazardous and that it is the part of wisdom to regard all such cases as malignant.

Precancerous lesions of the corpus uteri are commonly designated as fibroid tumors, polyps and hyperplasia of the endometrium. When we recall that fibroids and cancer of the body of the uterus are associated with far greater frequency than are fibroids and cancer of the cervix, it is fair to assume that there is a causal relationship. If such there be, then we may further assume that the endometrial changes accompanying fibroids of the body of the uterus constitute a precancerous lesion.

While benign polyps may become malignant, many errors in diagnosis made by the pathologist are due to multiplication and stratification of the epithelium.

So-called hyperplastic endometritis is unquestionably a precancerous lesion and the line of demarcation between the benign and the malignant cannot always be discerned by the most competent pathologist. Great increase in number and irregularity of the gland structures may present a most perplexing problem. We must, however, recognize the fact that increase in the cell-layers lining the surface and glands of the endometrium is not evidence *per se* of malignancy; nor is epidermization a necessary approach to malignancy.

Benign epidermization of the endometrium is not an uncommon finding as the result of curettage followed by the application of escharotics and as an accompaniment of pyometra. We occasionally see such apparently benign changes in the endometrium associated with cancer of body and cervix. While recognizing the occurrence of epidermization as a benign lesion, the author regards extensive changes of this sort as the precursor of cancer.

In all cases where great irregularity in cell form and size, atypical mitosis, and hyperchromatism are found, the diagnosis of malignancy is established.—(*Am. Jour. Obst. & Gyn.*, April, 1926.)

Shock in Pregnant and Puerperal Women

Bailey and Driscoll of New York formerly employed only the ordinary measures of position, heat, morphin water by rectum, saline under the breasts and intravenous infusion of saline. In 1924 they added blood transfusion, but even with special effort it was impossible to transfuse the emergency cases because of the difficulty of procuring donors within several hours. They then established their own group of donors, but were still unable to give a transfusion within three or four hours; therefore, they adopted gum glucose injections as a substitute for immediate transfusion or actually, in our procedure, as a substitute for intravenous saline infusion.

In 1921, Dr. Lilian K. P. Farrar reported the successful use of gum glucose as a prophylactic measure against acidosis and her report was later supplemented by a summary by Ainsworth Smith, of the shock cases so treated at the Woman's Hospital. There were eighteen patients with postoperative shock who recovered following gum glucose injections, and there were nine others who died; however, their condition was so serious that entirely aside from the shock their recovery was hardly to be expected.

In 1918, William M. Bayliss discovered that gum glucose solution and saline were of great value in the treatment of shock, especially when transfusion was impossible. Gasser, Herbert and Erlanger used hypertonic solution of 25 per cent gum acacia and 18 per cent glucose and in 1919 reported their results in twelve cases. Their theory was to make the solution hypertonic so that it would draw a great deal of water to the blood stream. However, this solution was so concentrated and the fluid was so slowly attracted to the blood stream that its use was discontinued.

Dr. Farrar used the 6 per cent gum but combined it with 20 per cent glucose. The crystalloid glucose attracted the water from the tissues and the gum maintained the pressure in the vessels through its osmotic and colloidal action. She has seen no deleterious effects from the injection which she has used since 1920. Our first injection of the solution was with material borrowed from her, and we have adopted the apparatus in use at the Woman's Hospital.

The authors believe that, in all cases of shock with hemorrhage, the injection of gum glucose should be followed within an hour or two by the transfusion of blood for the effect of the gum glucose is lost after four or five hours. Their admissions of shock cases in 1925 were numerous, and the satisfactory experience that they had with the administration of gum glucose in nine shock cases leads them to consider it of great value.

Sterilization with Arsphenamine

Prigge, the author, found extremely rarely spirochetes in the brain of mice after spontaneous recovery from recurrences and never after sufficient doses of neo-arsphenamine. Buschke's divergent results were due to the subtherapeutic doses he used. In such animals the spirochetes are present not only in the brain, but also in the blood. He found no indication whatever of any lowering of the immunity by arsphenamine in mice infected with recurrences nor in syphilitic rabbits.—(*Deut. Med. Woch.*, Feb. 26, 1926).

Vulvovaginitis in Infants and Young Children

The term vulvovaginitis is neither accurate nor sufficiently descriptive, says Philip F. Williams, of Philadelphia, for in the mild cases of vulvitis the vagina is rarely, at least markedly, involved; while in the prolonged complicated cases the many lesions to be met are not sufficiently covered. Kahn suggests this term be reserved for localized affections of the vulva and vagina, and that disease of the infant female organism caused by the gonococcus of Neisser be designated as "gonorrhea puellarum."

There is doubt that a large percentage of the cases are caused by the gonococcus. Many outbreaks, especially of the epidemic type in babies' homes, schools and hospitals, are caused by the ordinary mucous membrane infecting organisms responsible for colds and upper respiratory infections. Masturbation prompted by mechanical irritation of undisturbed secretion about the labia and clitoris causes a certain percentage and a flagrant disregard of cleanliness is the basic cause in many others. Contamination from the rectum to the delicate tissues anterior must be considered. Weakened resistance in poorly nourished or ill cared for children in the lower grades of society heightens the susceptibility to infection of the genital organs. Dissemination at times arises in birth infections, communal towels, toilets, baths and thermometers.

During the first twenty-four hours of life the vagina is said to be sterile, but by the third day it contains microorganisms. These include the various staphylococci, streptococci; later on the bacillus coli has been found, and in older children intestinal bacteria

form about half the organisms present in the vagina. The finding of organisms so constantly in the vaginas of young children might negative the existence of a natural antiseptic function at this age. The vaginal bacillus of Doederlein is said not to appear until puberty; thus the vaginal canal in infancy does not have its later natural protective function.

The gonococcus has been recovered in smears in from 10 to 50 per cent of cases in various series, and in many cases in pure culture. In a large group of cases streptococci of intestinal origin, colon bacilli, gram-positive bacille resembling diphtheroids, and various types of gram-negative cocci form the bulk of the organisms present. Vulvovaginitis is rarely caused by the Klebs-Loeffler bacillus, but has been noted frequently as an extension of the process in such exanthemata as measles and scarlet fever.

There has been considerable discussion and much laboratory work on the identity of the gonococcus of infantile genital infections. It would seem proved clinically that the gonococcus recovered from the majority of cases of vulvitis in children represents a less virulent type than the gonococcus of adults. Various types of intestinal protozoa, pin- or seat-worms, or trichomonas, have been regarded as the original source of infection or inflammation of the vulva, the rubbing and scratching consequent to the mechanical irritation excited by their presence opening a fair field for the propagation and effect of the skin surface or rectal bacteria. Possibly in some of the nonspecific cases an examination of the feces may explain the long continuance of the condition under otherwise correct treatment.

As a rule the typical case of gonorrheal vulvovaginitis presents the picture of a moderate desquamative erythema of the vulva. Often the inner aspect of the thigh presents a slight dermatitis. In many cases the vagina is affected incidentally, the soft, thin vaginal epithelium being penetrated easily by the invading cocci, the reddened areas on the vaginal walls being seen easily when the coating of purulent leucorrhea has been swabbed away. Not infrequently the urinary meatus participates in the general inflammatory reaction. Lesions of the cervix, the body of the uterus and the remainder of the internal genital organs are infrequent. Bartholinitis is infrequent. Local suppuration, that is, of the vulva, is not common, but inguinal adenitis with suppuration often occurs.

With the variety of etiologic factors present and recognized it is not surprising that the casuists have evolved several methods of classifying the inflammatory conditions of the vulva and vagina in children. Possibly the easiest method is to classify the cases as specific, when the gonococcus is recovered in culture or demonstrated in smears, and to classify all others as nonspecific. This latter group would include everything from the simple catarrhal conditions of physiologic origin due, in early infancy, to desquamative processes, and later to changes in metabolism, and further the mechanical reactions with their resulting inflammatory changes originated by uncleanness or rectal infestation, and the various auto-infections, micrococcus catarrhalis, etc. Relapses and second attacks are extremely frequent. These may be the result of insufficient treatment or to reinfection from the original source. Thus one uncured patient in an institution may be the source of a second attack among cured patients, or a cervical or rectal gonorrhea may persist and cause succeeding attacks of vulvovaginitis. In many cases relapses occur more than once. The criteria of cure vary so greatly that the term relapse would have to be used guardedly in some instances. Gonorrhea of the rectum takes longer to cure, but relapses of gonorrheal proctitis are said to occur comparatively rarely.

The diagnosis of gonorrheal vulvovaginitis rests essentially upon the demonstration in the stained smear preparation of the diplococcus of Neisser. As a general statement the prognosis of infantile vulvovaginitis is regarded as favorable. The duration of the disease should be relatively short, provided that the causative factor is not continuously active or that the greater irritation of too active treatment is not responsible for the continuance of the disease. The basic principle in treatment is cleanliness, ordinary soap and water cleanliness. This in itself will effect a cure in a large proportion of the simple catarrhal, mechanically produced types resulting from dirt irritations, and nonspecific bacterial cases. Combined with such simple hygienic therapy may be added soothing dusting powders. In some instances tonic treatment may be added. In cases of oxyuriasis the proper helminthic must be added. In the specific cases, or in the nonspecific cases resisting treatment, local antiseptic measures are in vogue. The medicaments used are many. Gellhorn and Stein recommend the use of silver nitrate and mercurochrome, respectively, in a 1 per cent strength in an ointment base consisting of equal parts of lanolin and white vaseline. This is injected into the vagina by means of a simple glass syringe to which is attached a small rubber tube. The vagina is filled with the ointment, and the excess is allowed to spread over the vulva. The injections are made daily. Stein reports the gonorrheal patients are cured in ten weeks, the suspicious cases in six weeks, and the nonspecific cases in five weeks by this method, and the follow-up

work demonstrates its efficiency, there being no recurrence in twenty cases after a year.

If the condition resists simple hygienic therapy or the locally applied chemicals, vaccines should be tried. Indeed the benefits from the use of vaccines are so confidently recommended by many observers that it is a question whether this method should not always be adopted as a specific part of the treatment. Consequently it would be advisable to take a culture, at the time of making the early smear preparations, to obtain a growth of the organism present for an autogenous vaccine. Naturally autogenous vaccines are to be preferred, and for an initial series of injections, the administration of from 25 to 50 million of organisms are recommended to be injected at intervals of from five to seven days for five weeks. In every case in which the gonococcus is found it should be regarded as the primary infecting agent, and in case it is impossible to obtain autogenous vaccines a stock gonococcus vaccine may be used for the class reaction produced. The initial dose for a child of one year of a stock gonococcus vaccine is given as from one to three million organisms. It may be remarked that prolonged local treatment may be injurious, by the constant chemical irritation and by lessening any chance for recovery of the natural defensive resources of the vagina against bacterial invasion.—(*Am. Jour. Obst. & Gyn.*, April, 1926.)

Lacerated Perineum with Retroverted Uterus

Dr. A. W. Morton, reports this case: Mrs. G. W., age 37; widow; two children. After the birth of the last child she had an operation for appendicitis and both tubes removed. Since the time of this operation she has suffered with extreme pain the day before and two days following menstruation. The menstrual flow otherwise is normal. When in the upright position she feels as though the uterus is passing out of the vagina. The laboratory findings of urine and blood are negative. She is rather a spare-built woman of 115 pounds, five feet six inches tall, and of a nervous type. Upon physical examination the perineum is found lacerated through the sphincters to the rectum, and a left unilateral tear of the servix. The body of the uterus is about double the normal size and resting on the rectum, but freely movable.

The patient is prepared for the operation by shaving the parts and giving an enema the night before with a vaginal douche. She desires ether. We explain that an injection will be given and after the examination, if found necessary to operate, ether would be administered. I explained to the physicians beforehand that while they were in the operating room, not to make any comments as to the operation and I would do the entire work without her realizing any operation had been performed. After injecting three grains novocain the uterus was caught with Volsem forceps and pulled downward, swabbed with tincture of iodine. The cervix gradually dilated, and during this time I was explaining to the physicians that we were making rather a thorough examination to place the uterus in position and I was sure, that they would agree it would not be necessary to operate in this case and I was delighted to change my ideas from an operation to the manipulation, at the same time these comments were made to the physicians that the patient might understand we had changed our mode of procedure.

The uterus was curetted and the cervix repaired with chromic catgut, then an incision was made with curved pointing scissors from the junction of the mucous membrane of the skin from high on the labia on the right side to the same position on the left, separating by means of a scissors the mucosa of the vagina, then seizing the elevator muscles on each side with mouth-tooth forceps, pulling the muscles together with continuous No. 2 chromic catgut from the bottom of the space finally to the fascia above. The mucosa was closed with metal clamps which built up a strong perineum. The abdomen was then disinfected with iodine and she was told that we wanted to make a thorough examination as we had done below, so an incision was made from the umbilicus to the pubes. The omentum which had adhered to the former line of incision was separated and ligated. The uterus was lifted into position. The fundus of the uterus was rubbed with gauze so as to make a raw surface over which we stitched the broad ligaments from the front to the posterior part which holds the uterus in perfect position.

We believe that peritoneum gives better support to the uterus than the muscular tissue with the round ligaments which are so often used for the purpose above mentioned. The peritoneum and fascia were closed, and a few interrupted stitches of silk-wormgut passed through and gently tied, skin closed with metal clamps, dressing applied and patient returned to her bed being congratulated by those present in cheating the surgeon out of an operation. We seldom believe it necessary to resort to this form of suggestion in handling a patient as we usually have their co-operation, but you can readily see the simplicity of doing operations with this form of analgesia when you have co-operation of the patient.—(*Morton Hosp. Bull.*)

Surgery

Technic of Use of Removable Radon Seeds in Carcinoma of the Tongue

Joseph Muir describes a new technique of radium therapy in lingual carcinoma which offers a practical means of irradiating even the most inaccessible tongue lesions. This is accomplished by the implantation of removable platinum radon seeds. As the methods of treatment heretofore used have always proved unsatisfactory, this article is of especial importance from a clinical standpoint.

The various methods by which lingual carcinoma has previously been treated are discussed and their advantages and drawbacks considered. Imbedding of bare tubes according to Janeway's method affords an even distribution of radiation, but causes necrosis which is invariably followed by sloughing and may even induce unavoidable fatal hemorrhage. If screened seeds are used, necrosis is avoided, but they are objectionable because they must remain in the tongue as foreign bodies. The platinum needles advocated by Regaud also obviate necrosis and can be removed when radiation has been accomplished, but proper distribution of these applicators is very difficult; they cause too much trauma; and above all, they are hard to immobilize and cannot be placed upon the posterior dorsal surface of the tongue.

The method offered in this article obviates all these difficulties, while retaining every desirable feature. The seeds are completely screened with platinum, thus doing away with necrosis and sloughing; they are easily withdrawn after adequate dosage has been delivered, so that they do not remain in the tissues as foreign bodies. These seeds can be placed in any position required, just as readily in the hitherto inaccessible "root" of the tongue, as in more favorable positions. The article is profusely illustrated, demonstrating the exact method of approach to these inaccessible lesions.

The growth is first carefully palpated, and the number of seeds required determined according to its depth and surface extent. When a seed has been placed in the desired position, the attached thread is left protruding from the point of entry, where it is cut off so as to leave just enough to be readily grasped with forceps at the time of removal.

The entire treatment causes no pain, and but slight inconvenience to the patient; and when skillfully performed under proper aseptic precautions, the technique offers an excellent means of solving one of the most vexing of clinical problems.—(*Annals of Surgery*, May, 1926.)

Spinal Anesthesia in Some of the Central European Cities

Julius Jarcho describes the technique as employed in several clinics and states that there were no deaths which can be ascribed directly to spinal anesthesia. This is true despite the fact that in many institutions spinal anesthesia does not receive a fair trial. For example, it is often given to patients for whom general anesthesia is contra-indicated, that is, to patients whose organism is encumbered by some pathological condition over and above the one which required operative relief. Lumbar anesthesia is practiced in European clinics gives the surgeon greater comfort than he formerly had, but at the same time it exacts from him greater attention to technique. He must make more liberal use of the knife in dissection, must avoid rough handling of the viscera, and must not permit the use of force in the retraction by his assistants.

After lumbar anesthesia patients present a much better appearance than after general anesthesia, in that they are more cheerful and partake more readily of nourishment. The hospital wards are freed from the familiar post-operative retching and vomiting, and much time and energy is saved by the nurses. There is no fear of inhalation pneumonia or of aspiration of vomitus. The patient requires calm encouragement, and little else. Finally it must not be forgotten that spinal anesthesia has widened the indications for operations, since in many cases where the surgeon would be reluctant to operate for fear of general anesthesia he may proceed without hesitation. From these considerations it is evident that lumbar anesthesia has proved to be a decided success.—(*Current Researches in Anesth. & Anal.*, April, 1926.)

Nitrous Oxide-Ethylene-Oxygen Anesthesia for Exodontia and Oral Surgery

In premedication it has been found when $\frac{1}{8}$ gr. morphine sulphate and 1/150 gr. atropin sulphate or when 0.05 Gm. ($\frac{3}{4}$ gr.) of procain is dissolved in a solution of magnesium sulphate, either 25% or 50%, and given hypodermically, the action will be synergistic to such an extent as to facilitate anesthesia. It becomes easier to administer the anesthetic, less gas will have to be used and the period immediately postoperative will be unaccompanied by vomiting, pain and psychic activity. The injection is given

into the arm about 20 minutes before the commencement of the anesthesia.—(*Int. Jour. Orth. Oral Surg. and Radiol.*, March, 1926.)

Inhalation vs. Regional Anesthesia for Prostatectomy

Most important for successful prostatectomy is preliminary drainage of the bladder. O. S. Lowsley and H. E. Rogers recommend suprapubic drainage because it is complete and does not cause irritation. For the operation they greatly prefer regional to general anesthesia. They report 100 cases in which each method was used. Thirty-eight two-stage perineal prostatectomies were performed under general anesthesia and ninety-eight under regional anesthesia. All of the patients treated under general anesthesia showed an increase in the blood pressure and twenty-three went into shock. Of those operated upon under regional anesthesia only three went into shock, but one of these died. In the general anesthesia group there were two cases of uremia, four cases of pneumonia, and one case of embolism, while in the regional anesthesia group there was only one case of uremia and in eighty-seven cases there were no complications.

After the operation performed under general anesthesia the average stay in the hospital was thirty-three days, while after operation performed under regional anesthesia it was twenty-two and seven-tenths days. In the general anesthesia group the mortality was 14 per cent. Of the patients operated upon under regional anesthesia, three died, one from hemorrhage, one from infection, and one from embolism.—(*N. Y. State Jour. Med.*, p. 893, 1925.)

Local Versus General Anesthesia for Upper Abdominal Operations

As a basis for this paper by J. Tate Mason 100 consecutive upper abdominal operations were studied. Fifty of these were performed under ether and fifty under local, or local and gas anesthesia. That the information regarding this group of cases might be obtained with the greatest possible accuracy, a group was selected from within a twelve-month period. All operations were performed by one surgeon, in the same hospital, with practically no changes in the surgical staff or the floor nurses. Local anesthesia, as compared with anesthesia by general narcosis, has proved to possess advantages of cardinal importance. Notwithstanding the relatively low mortality from ether and chloroform anesthesia, the damage done to kidney, liver, and lung tissue by general narcosis as compared with the effects on these organs by local injections, is considerable.

Since the institution of relatively non-toxic drugs, novocaine, procain, etc., in local anesthetic work, degenerative changes in parenchymatous organs are negligible, and pneumonia, bronchitis, nausea, vomiting, and shock are conspicuous by their absence in the post-operative period. At a time when the vital forces are most called upon, when the strength is at lowest ebb, ether anesthesia tends to reduce still further those forces. Prolonged vomiting causes dehydration, and acidosis results.—(*Ann. Surg.*, April, 1926.)

Strangulated Inguinal Hernia in an Infant

Basil R. Beltran reports the case of a male infant, nineteen days old, was admitted September 8, 1925. The child was well developed, weighing 9 pounds 12 ounces at birth and presenting no apparent abnormalities. On the morning of its seventeenth day after birth the mother noted that he was rather reluctant to taking of food. Several times the milk regurgitated. Frequency and quantity of defecation lessened. No bowel movement or micturition was observed the afternoon of the eighteenth day. When seen shortly after admission the infant appeared greatly toxic. There was a marked restlessness accompanied by greenish vomitus, marked abdominal distention and a scrotal swelling about the size of a large English walnut (5 cm.). The mass was bluish, doughy and well circumscribed, the upper margin ending abruptly at the inguinal ring. No attempt was made to perform taxis, but immediate operation was done. An incision over the left scrotal and inguinal regions was made under local infiltration anesthesia (novocaine and adrenalin). Repeated efforts to reduce the intestines were futile, so for a few minutes which included tying of the peritoneal sac and reduction of intestines, ether was administered. The time of the operation, including infiltration, was thirty-five minutes. Though the pulse was imperceptible and respiration exceedingly rapid, the infant was but slightly cyanotic on leaving the table. Five hours and again seven hours after operation the infant had copious bowel movements of dark brown fluid, defecation progressing irregularly. The mother was allowed to nurse the babe eighteen hours after operation. The wound healed by primary intention. Convalescence was rapid. No complications ensued. The patient left hospital twelve days after admission. In this case the strangulation lasted thirty-six hours or more.—(*Ann. Surg.*, April, 1926.)

Foreign Protein Therapy in Gastric and Duodenal Ulcer

Baake reports the results of the intravenous protein treatment of 250 cases of ulcer of the stomach or duodenum. Eighty-three of the patients were entirely freed from symptoms, 110 were benefited, and fifty-seven were not benefited. In eighty-two cases in which a re-examination was possible the incidence of improvement was about the same.

Not more than ten or twelve injections should be given in any one case. In sixty cases a recurrence developed. In most instances this was noted in the first four months and responded very favorably to renewed treatment. In two cases even a third course of treatment resulted in freedom from symptoms. As a rule the X-ray findings corresponded to the clinical improvement.

The results to date justify a trial of foreign protein treatment in all cases of gastric and duodenal ulcer, including those in which other conservative methods have proved unsuccessful. As contra-indications to the treatment, only chronic recurring hemorrhage and active tuberculosis are to be considered.—(*Mitt. v. d. Grenzgeb. d. Med. u. Chir.*, 1925, xxxviii, 404.)

Extramural Prolapse of the Urethra

W. T. Dannreuther relates this interesting case: N. S., a spinster, fifty-four years old, a domestic by occupation, residing in another city, was seized with a sharp pain in the region of the vulva at 2 P. M. on May 9th, 1925. The attack was not preceded by undue physical exertion, although constipation had been obstinate for many years. There was extreme urgency and increased frequency of urination, but only a few drops of urine were voided at each effort. On admission to the hospital at 5 P. M., examination disclosed the presence of a large tumor, projecting 52 mm. from the vulva and surrounded by the labia. It was 45 mm. in diameter at its widest part. The livid color, delicate surface, and the presence of a slit in its center through which a catheter could be passed into the bladder, identified the tumor as the urethral mucosa extruded through the meatus. The hymen was intact.

In the hope of reducing the size of the congested mass so that replacement might be attempted, the patient was put to bed; hot, wet compresses were applied constantly; the diet was restricted to fluids, and the bowels were cleared with enemata. These remedial measures neither afforded the patient symptomatic relief nor lessened the tumefaction to the slightest degree. In fact, the surface color gradually became darker, indicating necrosis. On May 12 the tumor was resected, following the technic recommended by Ashton. The prolapsed mucous membrane was grasped with Allis clamps and drawn forward. A silk ligature was then passed through the upper edge of the external meatus, directly across the canal, emerging at the lower margin of the urethral opening. The orifice was stretched open by means of the clamps, to make sure that the silk thread traversed the lumen of the urethra. The redundant tissue was cut away in front of the ligature, and the transfixion suture pulled out of the urethral canal with forceps. This loop was cut, leaving two sutures which controlled the edges of the wound at opposite points and prevented retraction of the mucosa. The circumference of the external meatus was then sutured with interrupted catgut stitches, approximating the severed mucous membrane and the margin of the urethral opening. A Pezzer catheter drained the bladder for forty-eight hours. Although the patient was permitted to void thereafter, 2 or 3 ounces of residual urine were recovered by catheterization after spontaneous urination for several days. Hexamethylenamine and sodium benzoate were prescribed for one week. Recovery was uneventful and the patient free from symptoms when she left the hospital on the twelfth day.

Pathologic Report.—The specimen is an oval piece of tissue measuring 20 x 18 x 17 mm. On gross examination, it is seen to be extensively hemorrhagic, and shows marked thrombosis of the blood vessels.

On one edge, the sections show transitional epithelium, with superimposed red blood cells, polynuclear leucocytes, and desquamated epithelial cells. Most of the surface, however, is denuded of epithelium. In the center of the sections there is a slit, lined by several layers of transitional epithelium, evidently the urethral ostium. Beneath this epithelial lining there are three glandular structures on one margin, apparently Skene's glands. The underlying stroma is extremely edematous, the fibrous connective tissue being heavily infiltrated with polynuclear leucocytes, lymphocytes, plasma cells, large mononuclear wandering cells, and extravasated red blood cells. The most striking feature of the microscopic picture is the enormous number of blood vessels, which resemble sinuses and are separated by narrow strands of connective tissue. They all show engorgement and beginning organization of thrombi. In some portions of these sinuses the epithelial lining is clearly recognizable, in some it is proliferated, and in others it is completely destroyed and the wall is infiltrated with polynuclear leucocytes. The histologic picture is quite similar to that of hemorrhoids.

Comment.—In this case no causative factor to account for the sudden extramural urethral prolapse other than chronic constipation could be discovered. At the same time, it is interesting to note that the patient did not suffer from hemorrhoids.

The most important detail of the operative treatment of prolapse of the urethra is the placing of the transfixion suture, to prevent retraction of the mucosa after the tumor is resected.—(*Amer. Jour. Obst. & Gyn.*, April, 1926.)

Sciatica Treated by Epidural Injection of Novocain

W. B. Marbury's technic is simple, requiring no previous preparation of the patient and may be utilized in the home, hospital or office. The solution is prepared by sterilizing 0.25 gms. novocain in a small quantity of physiologic saline and then adding enough of the latter to make 50 cc. The solution is injected slowly. If one injection does not relieve the pain, repeat in two days. His conclusions are as follows: (1) The pathology of sciatica is not definite. (2) About 65 per cent of the cases treated by the injection of novocain solution are either cured or greatly improved. (3) The best results have been seen in the cases which had the most pain. (4) The injection is simple and without danger, if properly done.—(*Va. Med. Month.*, Sept., 1925).

Sacral Anesthesia

While it seems fairly certain that 30 to 50 cc. of a 1 per cent solution of novocain are sufficient to produce adequate anesthesia for many of the genito-urinary and rectal operative procedures, this amount does not allow for the more extensive operations which can be done safely under sacral anesthesia, says Edward J. Ottenheimer. In this series the best and most consistently successful anesthesia was obtained with 90 to 100 cc. of a 1 per cent novocain solution and there were no untoward effects observed from this amount. The author is inclined to infer that large quantities of a weak solution are superior to smaller quantities of a more concentrated solution, particularly if a high anesthesia is indicated. If the resistance becomes very great after 40 to 50 cc. have been introduced it is injudicious to continue to introduce the solution under extreme pressure.—(*Bost. M. & S. J.*, Dec. 10, 1925).

Nitrous Oxid and Local Anesthesia in Abdominal Surgery

The advantages of combined anesthesia are striking, says P. K. Gilman. Manipulations are gentle; hence shock is largely eliminated. It is not rare for the patient to leave the table with an unchanged blood pressure. The patient is conscious by the time the postoperative toilet is complete. The often distressing and prolonged recoveries of consciousness from ether are eliminated. Postoperative nausea and vomiting are practically absent, except at times for an immediate small emesis. Bowel paresis and accompanying distension and gas pains are markedly reduced in their frequency of occurrence. Combined anesthesia patients take fluids earlier, may be nourished sooner than the ordinary ether patient, convalescence more rapidly and suffer less general postoperative distress.—(*Am. Jour. Surg.*, Jan., 1926).

Anesthesia and the Blood Urea

The blood of twenty-six persons operated under intraspinal anesthesia was examined. The urea content appeared increased for about a week. It may be due partly to the surgical trauma, since different toxalbumins and nucleins are released from the injured tissues. This explains why azotemia is often more pronounced after major than after minor operations. Affections of the liver and kidneys, as well as old age, may also be responsible for the high blood urea after an operation. The degree of the azotemia depends to a certain extent on the anesthetic used. It was considerably higher with stovaine than with procaine. It is probable that the drugs act first on the sympathetic system, while the kidneys are involved secondarily. This does not interfere with the advantages of the intraspinal methods, if the choice of anesthetics is made carefully.—(*Presse Med.*, March 27, 1926).

Suprapubic Prostatectomy

In G. Cattaneo's service, the mortality of over a thousand Freyer operations has dropped from 14.38 per cent in 1900 to 1 per cent in the last hundred cases. He tabulates the details in this last group to show the outcome according to the indications and technic, warning that prostatectomy must not be done as an emergency operation. He prefers the two-stage technic. Calcium chloride arrested postoperative hemorrhage in 50 per cent of his cases, rendering tamponing unnecessary. Local anesthesia for the epicystotomy and epidural for the prostatectomy, refraining entirely from general anesthesia, have contributed to the favorable outcome.—(*Arch. Ital. di Urol.*, March, 1926).

Treatment of Burns

A special committee of the Medical Society of Pennsylvania suggests the following treatment of burns:

The patient is undressed immediately or not, depending on the degree of shock. As soon as possible, all clothing should be removed, and an electric cabinet placed over the bed. The burned area is then covered with gauze saturated with a solution of 1/2-of-1 per cent solution of novocain with 10 minims of 1:1,000 adrenalin to each fluid ounce. When the patient has reacted from the shock, the area of a second-degree burn has become sufficiently anesthetized to allow the removal of the burned skin and opening of the blebs without causing pain. If the burn is of the third degree, the patient is anesthetized, and careful debridement is done within twenty-four hours. Fluid is administered only by mouth, but when rapid introduction is thought necessary, the intravenous method may be used. The novocain packs are used for from forty-eight to ninety-six hours, depending upon the extent of the burn and the time at which debridement was performed. On their removal, the area is sprayed every three hours with a fresh 2 per cent solution of dichloramin-T. In less extensive burns, packs of normal saline solution are used.—(*Atlantic Med. Jour.*)

The Diagnostic and Therapeutic Value of Paravertebral Novocain Injections

Laewen (Marburg) in 1922 and later in 1923, published the first results on the diagnostic use of paravertebral novocain injections in individual dorsal nerves. Injection in the tenth right dorsal nerve relieved prolonged colic-like pain and local feeling of pressure which emanated from the gall bladder. In ulcer of the pylorus, injections in the seventh right dorsal nerve gave relief. Injections in the D12, L1 and L2 of the affected side gave relief in kidney and ureter pains. In appendix pain repeated injections were necessary and the relief of pain was not always complete. The author has checked these results and has administered over 200 paravertebral injections.

Gastric pains react best to injections in the region of the nerves D6 and D7 (D8 is seldom necessary). Pyloric and duodenal ulcers require injections only on the right side; the more the infection favors the small curvature or body of the stomach or the higher it lies on the small curvature, the further toward the left the injection must be made. In this way it is not only possible to recognize the stomach as the location of the lesion but the latter's site can also be determined. Negative results from such an injection prove that other organs are the cause of the trouble. D9-11 right are the conductors of the pain in the gall bladder. If inflammatory changes have occurred in the primary lesion the paravertebral injection lessens the pain but does not relieve it completely.

For pancreas infections the eighth segment left is used. For kidney infections D12-L2; if the ureter is also concerned L3-4 are used. In infections of the stomach, biliary system and kidneys, definite diagnostic conclusions are made possible by this method. This is not the case in infections of the appendix and of a gynecological type on account of the necessity of repeated injections.

The method is a reliable diagnostic aid and offers various therapeutic possibilities although other methods of examination should not be omitted.—(*Ther. der Geg.*, 1925, Vol. 7, p. 335.)

Abdominal Surgery under Local Anesthesia

The ideal patients for this class of surgery are those of a placid, tranquil temperament without tense abdominal walls, says C. W. Allen. In less extensive operations, such as appendectomy, satisfactory anesthesia is obtained by infiltrating the retroperitoneal tissue on the proximal side of the cecum. As the local anesthetic one-half of one per cent novocain solution with 3 to 4 drops of epinephrin solution (1:1000) to each ounce, is amply sufficient.

For gall bladder and stomach operations a midline incision is made under novocain infiltration anesthesia. A finger is gently inserted down to the vertebral column through the space between the liver and stomach. A long blunt pointed needle is then passed down along the finger and made to penetrate the peritoneum just to one side of the vertebral column. Thirty c.c. of novocain solution is injected at this point. The opposite side is similarly injected. These two injections are sufficient for gall bladder and stomach surgery.

When the field of operation extends below the stomach, this organ, together with the transverse colon and omentum, is retracted upward, the space just below the transverse mesocolon is sought for and two additional injections are made in a similar manner. These four injections when properly made are sufficient to anesthetize the entire abdominal cavity above the pelvis. To anesthetize the pelvic cavity the needle is inserted high up along the course of the lumbosacral cord and 30 to 40 c.c. of novocain solution is injected just beneath the peritoneum on each side. The solution diffuses downward, infiltrating the entire sacral plexus. When only a limited amount of manipulation is

necessary and the parts are not bound down, as in the case of an ovarian cyst, adequate anesthesia is obtained by simply surrounding the operative area with local novocain injections.—(*N. O. Med. & Surg. Jour.*, Jan., 1926.)

Regional Anesthesia in Major Surgery

Payton R. Denman says a quantitative comparison of the toxicity of the alkamine esters of aromatic acids used as local anesthetics with the details of the intravenous method, using rabbits, was developed and adopted for the determination of the toxicity of novocain. The minimal lethal dose of novocain by this method is 50 milligrams per kilo body weight which represents a dose of 3.75 grams (58 grains) novocain powder for a man weighing 75 kilos (165 pounds) when injected intravenously as a 2 per cent solution.

For infiltration anesthesia in man novocain may be freely injected if slowly done, in properly prepared solution of 0.5 per cent to 1 per cent strength in almost unlimited quantities, provided care is taken not to inject the solution intravenously. Babcock has repeatedly used 500 cc. of a 1 per cent novocain solution in a single operation. Farr has employed 45 grains (3 gm.) in 0.5 per cent solutions without untoward symptoms, and Meeker employed 500 cc. in 0.5 solution without toxic manifestations.

The author has done practically all of his operations under regional anesthesia and in many cases has used as much as fifty grains of novocain without the slightest toxic symptoms. He feels that novocain solution can be used in sufficient quantity to do any major operation, with perfect safety.

The patients are rational at all times. Shock is almost unheard of, even in the most grave procedures. Nausea, vomiting and gas pains are practically nil. The patients can take nourishment the same day of operation. The bowel and kidney functions are undisturbed. A sufficient number of cases have already been reported to give regional anesthesia a high place in the realm of anesthetic methods and it is suggested that anesthetists and young surgeons of today lose no time in thoroughly acquainting themselves with its technic, scope and utility.—(*Am. J. Sug.*, April, 1926.)

Tracheo-Esophageal Perforation

B. Wiskovski, reports in *Ceska dermat.* 6:1, 1924, a man, aged 46, who had syphilis and who had not been treated, who suffered from a cough without dyspneic symptoms for several months. He suddenly developed dysphagia. Swallowing of food resulted in coughing and vomiting. Esophagoscopy examination showed an extensive ulcerating gumma on the anterior wall, and two weeks later a tracheoesophageal ulcer 6 cm. long and 3 cm. wide. The Wassermann test was positive. There was involvement of the liver and aorta. In spite of intensive treatment and gastrostomy, the patient died of pulmonary complications. Post-mortem examination verified the clinical findings. The trachea was probably the primary site of the gumma, as the ulceration spread from the lower edge of the lesion along the left tracheal wall and not toward the esophagus.—(*Arch. Derm. & Syph.*, p. 879, Vol. 12, 1925.)

Nonspecific Protein Therapy of Carbuncles and Syphilis

Milk injections constitute the method of choice of H. V. Weirauk for treating carbuncles and furunculosis. The favorable effect, if such is forthcoming, manifests itself promptly, and such an effect will be secured in a majority of cases. If there is no improvement after two or, at a maximum, four days, the case can be handled surgically. Syphilitic skin lesions show marked improvement or even complete regression following a course of milk injections. The latter, also, appear to be productive of good results in the management of old syphilitic patients who have been victims of over-treatment to their physical detriment.—(*Ohio State Med. Jour.*, April 1, 1926.)

Milk Injections in Ophthalmic Diseases

Ira E. Gaston reports a series of ten cases of infection of the anterior segment of the eyeball following perforating injuries; six cases of acute and subacute idiopathic iritis and iridocyclitis; one case of seriginous ulcer with hypopyon; two cases of iritis following operations for cataract were treated with non-specific protein therapy. All cases showed some benefit following the injections, and no serious reactions occurred in any of the patients where pure milk was used. The usual systemic reaction was a slight chill, slight nausea and a rise of temperature of from two to four degrees, which reached its maximum in six to eight hours and subsided in from eighteen to twenty-four hours. Bacterial examination of the various sample of milk employed showed that the degree of systemic reaction corresponds, in a general way, to the number of bacteria present.—(*Am. J. Ophth.*, Feb., 1926.)

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A Great Program

Hospitalization and a public health program properly financed at last by the City of New York! Thanks to the Mayor, the Board of Estimate and the Commissioners of Health and Public Welfare the sick poor are to be adequately cared for and the principles of preventive medicine effectively carried out. The appropriations totaling \$16,000,000 sound like a fairy tale.

The city is to have "the finest hospital facilities in the world."

The preventable diseases are to be wiped out so far as that is possible.

With all the other great projects going forward in the City of New York it seems to us that its pre-eminence as the medical center of the world is assured.

Surely the periodical medical press of the City stands challenged to meet worthily the new dispensation.

"Medical Heredity"

Professor William Browning's "Medical Heredity" presents an overwhelming array of evidence going to prove that the children of American physicians represent a superior intellectual type. The extraordinary contributions which they have made in all intellectual and esthetic fields, as compared with children not related to the professional group, challenges doubt. Dr. Browning has rendered the profession a peculiar service in assembling his vast data so thoroughly and presenting them so ingeniously. Of course, the professional sires of these children have constituted a superior intellectual class, which Dr. Browning establishes by arguments reaching back to the dawn of the Republic. Pride

in one's profession will be enhanced through a reading of this book, and much edification acquired. The work has a peculiarly piquant style. This book should be read by all the proud fathers of our guild for whom Dr. Browning has rationalized parental faith. It may be obtained from the Norman, Remington Company, publishers, of Baltimore, and is listed at \$4.

Seen in a New Light

The psychologists nowadays are throwing a great flood of light upon some of our notable—and notorious—characters. Byron's philanderings, his inability to fix his affections upon an individual woman for any length of time, were due to his sexual infantilism. He never grew up. All his life he remained in the Narcissus stage. He was never in love with anyone but himself and quite incapable of completely allying himself with one of the opposite sex.

Frank Harris has written a book (*My Life and Loves*) which recites with much detail his superhuman exploits with numerous ladies of the lower social orders. It is an exhaustive revelation of an impotent literary artist projecting his unvirile self in the guise of a seminferous Titan. It is also a pitiful exposition of the fact that a man of high intelligence, culture and ability may retain all his life the most puerile and faulty notions regarding matters of sex; indeed, we would say that it is a powerful plea for sex education of the very young—though intended only as a pornographic best seller.

In the Grand Style

In these days of pageants and panoramas we should open the Academy of Medicine that is to be, and the "up town" Medical Center, with really suitable ceremonies.

What would a really suitable ceremony be, in such a case? How should such an occasion be signalized? How might its significance be properly published and impressed?

Let us dramatize, objectively, the literary and scientific panorama of modern medicine.

We suggest that there be read, in costume, by distinguished actors, made up to represent the original authors, the great classical papers, judiciously edited and condensed, that have stood as milestones along the road of medical progress. Let Harvey, Jenner, Auenbrugger, Laënnec, Morton, Simpson and Holmes speak to us again, and let us fancy ourselves, for the while, to be actually in the presence of these great ones. A prologue and an epilogue to fit the occasion, written by, let us say, Percy Mackaye, should also be spoken.

The late Henry Miller's striking impersonation of Pasteur, in the play dealing with that great scientist which was produced not so long ago, will be remembered by many. There is no doubt that many distinguished members of the actor's profession would enlist in furtherance of the plan herewith briefly submitted.

Let us for once be dramatic, for the good of our scientific souls! The material out of our past that we have suggested is picturesque, dynamic, tremendous!

The occasion approaches. Dare we to do justice to it?

No Place for the Neurotic

Professor James R. Jack, head of the Department of Naval Architecture of the Massachusetts Institute of Technology, in a lecture before the Boston Society

of Arts, recently pointed out that danger was ever present in the operation of submarines, and that the problems of navigating submersibles required great skill and the utmost coolness of officers and crew. He thought that the phlegmatic nature of the Germans had a great deal to do with the success of their submarine operations. Englishmen and Americans, too, made excellent submarine crews, he said, but the Latin races, while very brave, were excitable, and for that reason not fitted for the constant physical and mental strain of submarine operation.

In this connection, one thinks of the coolness and intrepidity of Byrd and his pilot in their flight to the North Pole. Such men must wholly lack neurotic strains of the sort discussed by Professor Jack. In respect to nervous organization making good balance possible on all trying occasions they must be wholly normal.

We are assuming that North Pole flights and submarine operations are on about the same danger plane.

Professor Jack's remark about the Latin races prompts the recollection that the Commander of the Amundsen airship was an Italian.

It is our guess that the navies and air services of the nations do not differ greatly with regard to the nervous make-up of the personnel, since it stands to reason that the risks involved would be the last sought by the neurotic elements in any population. And there is no nation on the globe lacking in individuals of good nervous constitution.

Miscellany

CONDUCTED BY ARTHUR C. JACOBSON, M. D.

Life Extension

"Why should a man wish to prolong his life?" asked Professor Charles Richet the other day. This French scientist thinks that all the attempts *à la* Metchnikoff have failed to give any practical results. He does not think the prolongation of life desirable because the older we get the less we enjoy life. "Even with permanent youth, who can say whether life would be any happier? Perhaps it would be nice to stay young a little longer than jealous nature allows us. But our mother nature cares nothing for old people, and her voice is heard everywhere on this little planet shouting her fateful and imperious cry: 'Room for the young!'"

Too many of our health propagandists "crack up" longevity as a kind of selfish end in itself. This sort of thing appeals only to the anthropoid rabble.

It would seem intended by nature that our organs should lessen in resistance to pathogenic organisms as we grow older, and that we cannot circumvent nature in this respect without compensating losses.

It is true that certain tissues appear to be immortal when kept alive under conditions worked out, for example, by Alexis Carrel. But when highly organized, as in our vital organs, this sort of thing is finally put to rout by other factors, and so is really meaningless.

Suppose we could defeat nature physically. Could anything worse than life in perpetuity on earth be imagined? For the joy of living is not for the aged, however "well preserved."

Medical Happenings

Sir William B. Leishman, K.C.M.G., C.B., M.B., C.M. Glasg., F.R.C.P. Lond., F.R.S., LL.D.

Not only the medical profession but the whole scientific world learned with real grief the death a short time ago, after a brief illness, of Sir William Leishman, Director-General of the British Army Medical Service for the past three years, says *The Lancet*. He belonged to a select and extraordinarily able band of men who during the first quarter of this century have revolutionized the whole outlook of tropical medicine, and within that band he specially distinguished himself by his large and independent researches, while contributing with untiring and unselfish effort to the general output.

William Boog Leishman was born in 1865, the son of Dr. William Leishman, professor of midwifery and obstetrics in the University of Glasgow. He was educated at Westminster School, and entered the medical profession as a student at his father's university, where he graduated M.B., C.M. in 1886. He joined the R.A.M.C. the following year, holding his first commission, therefore, at the age of 22. He proceeded on foreign duty in 1890, and first saw active service with the Waziristan expedition in 1894. By this time he had already begun to take a close interest in bacteriology, especially in relation to the tropical diseases malaria and dysentery, with which he found himself in perpetual contact. On return to England in 1897 he was stationed at Netley, where he did duty in the wards, but spent all his spare time in the excellent laboratories of the Army Medical School under Sir Almroth Wright and Sir David Semple, then respectively professor and assistant professor of pathology. During this period he assisted Wright in the early work on typhoid vaccine and made some investigations into Malta fever, a disease which later he contracted himself in the laboratory. He also took part in the teaching and demonstrating in the classes for surgeons on probation, and did this so well and showed such aptitude that he was appointed assistant professor in 1900 when Semple went to India. We learn from Sir Almroth Wright that on his arrival at Netley it was significant that he seemed not to know his own splendid capacities for research. Wright had launched between the years 1897 and 1900 his great antityphoid work, and was proceeding with researches in vaccine therapy. These were impeded because the bactericidal power of the serum did not give the necessary indications, and Leishman invented the method of testing the phagocytic power in vitro with resulting developments. At that time at Netley leucocytes were being stained by the cumbersome method which goes by the name of Romanovsky, and Leishman introduced his stain, which has now quite superseded its predecessor. Romanovsky had used mixed solutions of methyleneblue and eosin, and Leishman had the inspiration to mix these together to filter off the precipitate and to dissolve it in methyl alcohol, a solvent used by Jenner in making his stain. These things are mentioned to show how well there were combined in Leishman the ability to devise and acquire technique with the large views later to result in great ends.

At Netley, while still associated with Wright, the beginning was made of the discoveries which led to Leishman's early recognition as a pioneer in tropical medicine. He showed Wright some preparations which he had stained and which had been taken from the spleen after a post-mortem on a man who had died of "dum dum fever," as it was then called. The whole field of the microscope was thickly sown with small oval bodies corresponding with nothing that Wright or he had ever seen or read of—what are now known as leishmania parasites—and Leishman who was a most excellent artist, made some drawings and kept the matter in his mind. Later, when the Royal Army Medical School had moved to London, the work being done at what was then the laboratory of the Conjoint Board, Leishman noticed formed elements when looking at specimens derived from animals who had died with the trypanosomes recently discovered by Bruce and found in rats infected with nagana. These put him in mind of the organisms which had completely puzzled both him and Wright, and he worked on the theory that the organisms which he had previously observed were stages in the life-history of a protozoon, a view which was later confirmed in Calcutta by Rogers, who proved that these bodies, when introduced into a suitable medium, are converted into a flagellate resembling the trypanosome, thus substantiating Leishman's original view of the parasite.

That Leishman was not the first to see the parasites is now admitted. Cunningham, in 1885, described peculiar parasitic organisms in "Delhi boil," and considered that the bodies were a form of spore. In 1891 Firth appears to have seen similar bodies, but thought they were sporozoa. After Leishman's discovery, speculations were rife as to the nature of the bodies; Laveran and Mesnil suggested that they were piroplasms, but Ross, like Firth, thought that they were sporozoa, and afforded

them the dignity of genus by the title of "leishmania." This adaptation of Leishman's name has, in time, come to be applied to the whole group of diseases now known as "leishmaniasis." In 1903 Donovan in India recorded parasites similar to those described by Leishman in the tissue of patients dying of kala-azar, after which the organism, therefore, came to be known as the Leishman-Donovan body. And in the same year J. H. Wright, confirming Cunningham, saw bodies in an oriental sore which later became known as the parasite of oriental sore, or "Delhi boil," as it is sometimes called, and has been scientifically termed "Leishmania tropica." In 1904 came Roger's substantiation of Leishman's original view as to the parasite. The group of diseases is now much expanded. Similar parasites were found in sores in Brazil by Lindenburg, Carini, and Paranhos in 1909; Splendore and Carini showed that the peculiar ulceration of the pharynx and nares in South America, commonly known as bubas, was also leishmaniasis. It is now known that kala-azar has almost a worldwide distribution; it has been found in Central Africa and Northern China, while a similar disease is very common in the Aegean Islands and the Mediterranean area, where it attacks both children and dogs. The disease group which bears Leishman's name is, therefore, of high economic importance, as one of the most widespread scourges which afflict mankind.

From 1905 onwards Leishman devoted much of his time to the observation of pathogenic spirochaetes, especially *Treponema pallidum* and the allied parasites of yaws and relapsing fever. His early investigations were concerned with the morphology of these spirochaetes and the relation which might exist between European and African forms, but he found it was impossible to substantiate any morphological differences. He expended great labor in attempting to cultivate these organisms in artificial media, and observed in so doing the peculiar agglutination of the spirochaete. His experiments were afterwards directed towards the changes undergone by the spirochaetes in the tick's body, and the manner in which hereditary transmission takes place in the arthropod. He found it impossible to trace the spirochaetes in the body of a tick later than the tenth day after feeding, and his researches on the eggs laid by infected ticks were negative. While these experiments were in progress he was struck by the frequent occurrence of clumps of granules in various parts of the tick's body which he suspected as being of parasitic nature, and which he continued to regard as stages of the development of the spirochaete; and later, when the advantage of the dark-ground illumination method came in he was able to satisfy himself that young spirochaetes actually developed from these granules. His researches on this subject were made the subject of a summary in the Horace Dobell lecture delivered before the Royal College of Physicians of London in 1920. Much of this work has been confirmed by Nicolle and his colleagues in their observations upon the development of the spirochaete in the louse, in which gradually the organisms appear to undergo a life-history similar to that described by Leishman.

In 1903 Leishman succeeded Wright as Professor of Pathology in the Royal Army Medical College when, in addition to discharging the arduous duties of the post with the spirit which bore splendid fruit during the whole ten years of his office, he carried out a scheme in respect of antityphoid inoculation which had been already devised by Wright and himself. This was to inoculate a series of groups of men with different doses of typhoid vaccine, afterwards measuring their immunization curves with a view to selecting the optimum dose of vaccine, which was thus fixed at 1,000 millions for the first dose.

The work which Leishman did in the introduction of vaccine and inoculation against typhoid fever constitutes his most important contribution to medicine, far-reaching as the other discoveries have been or may be. This method had already been tried during the South African War, but the reaction that it produced, and the ill-health which resulted from the inoculation as then prepared, was too severe, allowing a certain class of critic to insist that the cure was worse than the disease. But from 1902 onwards, Leishman, in association with Wright, busied himself in the preparation of a less potent preparation. The early experiments were summarized in the Harben lecture for 1910 and published in the *Journal* of the Royal Institute of Public Health and are familiar to all.

The original ravages of enteric fever in India amongst the British garrisons, where it was especially prevalent, were taken into account as well as the lessons of the South African War, when there were no less than 57,600 cases of enteric fever with over 8,000 deaths. To the subsequent intensive study we owe the preparation of the typhoid vaccine which was used with such success in the recent war, a success mainly lying in the observations of the growth of the organism and in the details of the technique of sterilization. The result achieved is now universally recognized and the lessons have been published widely. They were well set out by Leishman himself in a paper entitled "Enteric Fevers in the British Expeditionary Force of

1914-1918" and published in the *Glasgow Medical Journal* in 1921. From this paper we learn that he first decided that the best protection could be obtained by the initial test of 500 million organisms, followed by a week or so later by one double that amount. The immediate returns appeared to be unfavorable to the continuance of this method, but it was ascertained that the increase of cases was due to the paratyphoid organisms, and when these were added to the vaccine almost complete protection was produced—a striking vindication of Leishman's work.

As the result of the inoculation of the vaccine there was secured for our men a considerable measure of protection against the paratyphoid infection as well as against typhoid, though the immunity produced against the former was not of such a high degree as against the latter. We may quote the remarkable figures. In 115, in the strength of over 600,000 troops there were only 570 cases of enteric fever notified with 34 deaths; a striking comparison with the figures of 14 years previously in South Africa.

While all this original work was in process Leishman was winning a wonderful name for himself, for he developed powers of teaching which a large number of officers can testify proved to be of the highest value to them. Many we know would speak with real gratitude of the good derived from his instruction and guidance. He was a most patient and painstaking instructor—nothing here seemed a trouble to him that would assist in explaining a point or clearing up a difficulty; he was an able and even brilliant lecturer, and it is no wonder that his work should have borne the fruit that it did.

At the outbreak of war Leishman, officially described as Expert in Tropical Diseases on the Army Medical Advisory Board, was directed to join the Expeditionary Force on Oct. 3rd, 1914, and was attached in an advisory capacity to the staff of the D.M.S. of the Force. A few months later the designation of "Advisor in Pathology" was attached to the post. The following list will give some idea of the different lines of work which had devolved on him by the year 1917: 1. Adviser in pathology to the Expeditionary Force. 2. Member of the Advisory Board of the Director-General, Medical Services, G.H.Q. 3. Chairman of research committees on trench fever and on nephritis. 4. Inspection of all mobile and hospital laboratories, at the front and on the lines of communication. 5. Coördination of the work done in the laboratories. 6. Recommendations on appointments to the charge of laboratories. 7. Advice on the installation and equipment of new laboratories. 8. Distribution of laboratories and pathologists to meet local emergencies. 9. Advice to medical store department on laboratory equipment, reagents, apparatus, etc. 10. Advice on all matters relating to the supply and employment of sera and vaccines. 11. Advice on tropical and parasitic diseases in native troops and labor contingents. 12. Collaboration with the A.D.M.S. (Sanitation) in the control of infectious disease. 13. Collection and analysis of returns relating to enteric fever and tetanus. 14. Reports to the D.G.M.S., G.H.Q., and to the D.G.A.M.S., War Office. 15. Arrangements for the collection of pathological specimens. 16. Member of the Inter-Allied Sanitary Commission, Paris. 17. Member of the Inter-Allied Surgical Conference, Paris. 18. Liaison with the pathological work of the armies of the Allies. Even this list is not exhaustive; it is set out to show the multifarious and important responsibilities which had accrued to him by the time the critical later stages of the war were reached; that he should have fulfilled them satisfactorily makes a splendid record of service, and that he should have been instructed to undertake them proves what the estimate of him was in the highest places.

When the Directorates of Pathology and Hygiene were formed at the War Office in 1919, Sir William Leishman was appointed Director of Pathology and remained in that appointment until 1923. During those four years his activities were far-reaching, and his work established the newly formed directorate on a solid and enduring foundation. His advice and support to the then Director-General on matters concerned with pathological science were of extreme value, both to his official chief and to the Army generally.

In 1923 he was appointed to be Director-General of Army Medical Services at the War Office, an onerous post, the duties of which he was performing with the greatest distinction and ability when he was cut off in the midst of his work, and just when so many of the problems and projects in which he was engaged bore promise of ampler fruition. While many regretted the necessary break constituted in a brilliant scientific career by the call to become Director-General, there were at least as many who recognized that Leishman's right to be the head of the Service was so incontestable that any other appointment would have been open to criticism, while it was certain that he would bring to that position the qualities which he had already displayed in scientific and official fields, to the great benefit of an organization to which he was devoted.

Outside the Army Medical Service Leishman's appointments and responsibilities were also great and various. He was a

member of the Yellow Fever Commission, West Africa (1913-15), and of the Medical and Sanitary Advisory Committee for Tropical Africa at the Colonial Office; he was for ten years a member of the Medical Research Council, vacating his seat on appointment as Director-General; he was a member of the Scientific Advisory Committee of the British Empire Cancer Campaign; quite recently he was appointed chairman of the Foot-and-Mouth Disease Research Committee of the Ministry of Agriculture; he was a past President of the Society of Tropical Medicine and Hygiene and had acted as examiner in pathology at Oxford and in tropical medicine at Cambridge. Just before his death he was elected President of the Section of Comparative Medicine at the Royal Society of Medicine, an appointment which shows alike that the wide range of his learning was appreciated by colleagues, and that his own desire was keen to remain actively associated with scientific work as far as the duties of his high official post would permit him to do so. His contributions to medical and scientific literature were numerous and particularly instructive as being personal records.

In 1910 Leishman was elected a Fellow of the Royal Society, and served for two years as Vice-President. He was knighted in 1909, and in 1912, having just been promoted Colonel, he was appointed honorary physician to the King. He was created C.B. in 1915, K.C.M.G. in 1918, and K.C.B. in 1924, and was continually mentioned in dispatches during the European War; he was a Companion of the Legion of Honor and held the Distinguished Service Medal of the United States Army.

The story thus set out indicates a life that was lived to the extreme limits of intellectual ability and physical capacity, but it remains to add that the brilliant researcher and competent official was the simplest of men, transacting his duties with no evidence of strain and bearing his honors without a trace of manner. As far as possible, he seemed to efface himself, his courtesy was clearly genuine, his personal kindness can be testified to by a large series of contemporaries and juniors, and his generosity to fellow workers was unfailing. His premature death after a brief illness was a real grief to friends, colleagues and a big and various public.

The funeral was conducted privately at Highgate.

Arkansas Still Inactive

Arkansas is one of the two remaining states that have separate boards of eclectic medical examiners. In the last ten years this board has licensed 227 graduates of inferior medical schools, of whom 199 held degrees from the Kansas City College of Medicine and Surgery—exposed two years ago as a diploma mill—for which legal proceedings looking toward the revocation of its charter are now in process. Following the exposure of the Missouri diploma mill ring, vigorous legal measures were promptly and successfully taken in Connecticut, California and other states toward revoking the licenses of those registered on the basis of such diplomas. Arkansas, however, has continued inactive in spite of the odium resting on the character of such applicants. In spite of the glaring disclosure of the Kansas City College of Medicine and Surgery as a diploma mill, the eclectic board has calmly continued to provide state licenses for such "graduates"! Although only one such graduate was licensed in 1924, this was evidently due not to any qualms of conscience on the part of the board but to the temporary inactivity of the diploma mill concerned because of the court investigation. Is it not time that Arkansas should undergo a house cleaning? Is it content to remain in the clutches of Alexander and his diploma venders? Is Arkansas satisfied to have its sick and injured citizens subjected to such ignorance, incompetence and bungling?—*Journ. A. M. A.*, May 15, 1926.

Medical Society of the Missouri Valley

The 39th annual meeting of the society, to be held Sept. 15-17, jointly in Omaha and Council Bluffs, promises to be one of the most important sessions of this time honored organization. The Missouri Valley Medical Association has been for many years an organization for the dissemination of medical knowledge and exchange of ideas among the profession of the state lying wholly or in part in the great Missouri river basin. Last year a remarkable program was given by this society in St. Joseph, Mo. For variability and value of material presented it was equal in quality to that given at the great session of the Tri-State at St. Paul a month later. The contributions to this program by the various departments of the Universities of Missouri, Kansas, Iowa and Nebraska were of a high order. This session did not receive the appreciation that was its due from the profession of the region.

The Universities of Missouri, Kansas, Iowa, Nebraska and Creighton University have promised for this year short, snappy contributions on subjects applicable to the day's work of the practicing physician. It is imperative that the practitioner be kept acquainted with the work going on in the laboratories, and there is no better way of maintaining this contact than by hav-

ing the laboratory teachers in our medical schools appear and present "their stuff" at frequent intervals before associations composed of practitioners.

The program planned for the Omaha-Council Bluffs meeting will consist of papers and lectures on various scientific and clinical subjects and clinics. Fully half of the time will be devoted to clinics given by men of national reputation. Among those who have already consented to appear on the program and hold clinics are: Dr. Hilding Berglund, Professor of Internal Medicine at the University of Minnesota, Minneapolis; Dr. Elliott C. Cutler, Professor of Surgery of Western Reserve University, Cleveland; Dr. Irving S. Cutter, Dean of Northwestern University College of Medicine, Chicago; Dr. McKim Marriott, Professor Pediatrics of Washington University, St. Louis; Dr. E. C. Rosenow of the University of Minnesota, Mayo Foundation, Rochester, and Dr. Gabriel Tucker of the Bronchoscopic Clinic of the University Hospital, Philadelphia.

Negotiations are under way with several other men of equal prominence in their respective lines.

The Program Committee will make this meeting one that no up-to-date clinician can afford to miss. A complete program will be published in ample time. Reserve the dates now—September 15-16-17. Headquarters—Hotel Fontenelle, Omaha. Dr. A. D. Dunn, of Omaha, is president. The program committee is composed of:

John E. Summers, Omaha, Chairman.
Donald Macrea, Council Bluffs, Vice-Chairman.
William Wheery, Omaha, Nebr.
P. T. Bohan, Kansas City, Mo.
E. H. Skinner, Kansas City, Mo.
T. G. Orr, Kansas City, Mo.
J. M. Mayhew, Lincoln, Nebr.
Granville N. Ryan, Des Moines, Iowa.
Guy L. Noyes, Columbia, Mo.
Fred Smith, Iowa City.
John M. Bell, St. Joseph, Mo.

Arrangement Committee

Earl Sage, Omaha, Nebr.
M. E. O'Keefe, Council Bluffs.
Chas. Wood Fassett, M.D., Secretary, 115 East 31st St., Kansas City, Mo.

Hospitals Maintained by National, State and Local Governments

The hospital services maintained by the national government have been considerably increased since 1909, largely because of conditions resulting from the World War. Of all hospital beds, the proportion controlled by the national government has increased from 2.1 per cent in 1909 to 2.3 per cent in 1914, 3.1 per cent in 1918, 6.8 per cent in 1923 and 7.1 per cent in 1925. There are now 299 hospitals maintained by the national government with a total capacity of 57,091 beds, of which an average of 42,377, or 74.2 per cent, are constantly occupied. These figures cover the hospitals maintained by the United States Army, Navy and Public Health Service, the Veterans' Bureau, and several hospitals for government beneficiaries located in the District of Columbia and elsewhere.

For many years the state governments have had a comparatively large part in the provision of hospital facilities, particularly in maintaining large hospitals for the insane, the tuberculous and sufferers from other chronic diseases. In 1909, the state governments maintained 45 per cent of all hospital beds, but by 1925 the percentage had been reduced to 40. The capacity of the 351 hospitals maintained by state governments, however, has increased from 189,049 beds in 1909 to 317,264 beds in 1925, and of the latter, 305,466 beds, or 96.2 per cent, are ordinarily occupied. To an increasing extent the states are creating and maintaining general teaching hospitals for their state university medical schools. In sixteen states, eighteen such hospitals are now being maintained with a total of 4,582 beds and an average of 3,467 patients. Ten states also maintain twenty-three general hospitals which are not essentially for teaching, these having 4,496 beds, of which 3,865 on the average are regularly occupied. Of these states, Mississippi maintains four regional charity hospitals, Louisiana has two such hospitals and Pennsylvania has ten, these being for the care of the sick and injured in the mining districts. Other states that maintain some form of general hospital service, including mainly hospitals for crippled children, are Illinois, Iowa, Minnesota, Nebraska, New York, North Carolina and Rhode Island.

Local and county governments now maintain 471 hospitals, with 53,027 beds. City governments maintain 371 hospitals with 59,630 beds, and cities and counties combined maintain sixty-nine hospitals with 7,118 beds. Altogether, county and municipal governments combined support 911 hospitals having 119,775 beds, comprising 14.9 per cent of the entire bed capacity in the United States.